



CATALOGUE No. 36

ALL PREVIOUS LISTS CANCELLED

JANUARY, 1925

THIS
CATALOGUE
IS PRESENTED TO

WITH
THE COMPLIMENTS OF
THE
CRITTALL
MANUFACTURING CO. LTD.

METAL WINDOWS



REGISTERED

TRADE MARKS



CRITTALL
MANUFACTURING CO. LTD.,
BRAINTREE, ENGLAND.

TELEPHONES — BRAINTREE 106 — LONDON. HOLBORN 326. 327 AND 723
TELEGRAMS — CRITTALL, BRAINTREE — CRITMANCO, HOLB, LONDON.
LONDON OFFICE AND SHOWROOMS — 246 HIGH HOLBORN, LONDON. W.C.1.
MANCHESTER OFFICE AND SHOWROOMS — 45 SOUTH KING ST, MANCHESTER.
LEICESTER OFFICE AND SHOWROOMS — 3 GRANBY STREET, LEICESTER.
GLASGOW OFFICE AND SHOWROOMS — 61 QUEEN STREET, GLASGOW.

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ADDRESSES OF THE CRITTALL MANUFACTURING CO. LIMITED

*Crittall Windows may be seen and full particulars obtained at
the Company's offices, agencies and affiliations as follows:*

HEAD OFFICE. Manor Works, Braintree
LONDON OFFICE. 246 High Holborn, W.C.1
MANCHESTER OFFICE. 45 South King Street
LEICESTER OFFICE. 3 Granby Street
GLASGOW OFFICE. 61 Queen Street

AUSTRALASIA. The Crittall Manufacturing Co. (Australia) Ltd.
Works, Melbourne

BELGIUM. Representative: Louis Kruyt, 9 Rue Draps Dom,
Brussels

CANADA. Agents: Canadian Metal Window and Steel Products
Co., 160 River Street, Toronto

CHANNEL ISLANDS. Agent: A. H. White, 13 Parade, Jersey

CHINA. The Crittall Manufacturing Co. Ltd. (China Branch), 2A
Kiukiang Road, Shanghai

Agents: Bradley & Co., Hong-Kong; J. Whittall & Co. Ltd.,
Tientsin

EGYPT. Crittall, Jacks & Co., 89 Gheziret Badrane, Cairo.

FEDERATED MALAY STATES. Agents: William Jacks & Co.,
Ocean Buildings, Prince Street, Singapore

HOLLAND. Koninklijke Fabriek F. W. Braat, Delft

INDIA. The Crittall Manufacturing Co. (India) Ltd., Fowlers' Build-
ings, Bombay

Agents: Wm. Jacks & Co., Calcutta, Rangoon, Karachi, and
Madras

KENYA COLONY. Agents: The Anglo-Baltic Timber Co., Duke
Street, Nairobi

SOUTH AFRICA. The Crittall Manufacturing Co. (South Africa),
Ltd., 13 Loveday Street, Johannesburg, Works at Durban

Also at Capetown, Port Elizabeth, and East London

SOUTH AMERICA. Agents: J. and J. Drysdale & Co., 440 Calle
Peru, Buenos Aires

UNITED STATES. Crittall Casement Window Co., 10951 Hearn
Avenue, Detroit, Mich.

INTRODUCTION



SO far as the Universal Casement is concerned, the details set out in our last catalogue [issued in 1922] remain unaltered, although various improvements in the fittings and in the construction have been introduced.

The tremendous demand for the Standard Metal Window has already compelled us to double the capacity of our Witham Works, and further extensions are in progress. Many radical improvements in the design of these standard windows have been made and are described in that section of this catalogue.

Realizing the importance of prompt delivery we have prepared a stock of over 20,000 windows, covering every type in the range of standards, and immediate despatch by our own lorries can be made.

A new range known as Tropical Standards replaces those shown on pages 78 and 79 in the old list. These new standards have been developed after several years' experience of the requirements of Tropical Countries, and will be found to cover a large field. Details of Shutters and Flyscreens for use with these standards have also been carefully worked out on practical lines, and full details are shown.

We have to make a *most important announcement* in introducing our Zincspira process, by which the necessity of painting the window so treated is eliminated. This process is fully described on pages 24 and 25.

The increased demand for our standardized Factory Sash has led us to concentrate upon developing them. [A new workshop has been installed at Maldon, Essex, for dealing with this product.] We have found that with the use of special sizes of a similar construction, that practically any requirement can be filled. Where larger frames are required, windows constructed of a stiff Tee section, into which casement ventilators are screwed, will generally be found to meet the requirement.

We have recently opened our own works in Durban, S. Africa, and are about to start similar enterprises in Australia and India. These workshops will enable us to deal with the immediate demands for our standard products in these countries, while the special windows will, for the present, continue to be made in England.

Recognising the necessity for supervising the erection of our windows, we keep a skilled staff of erectors wherever our windows are used, and their services are at the command of our customers without extra charge.

SPECIFICATION



For CRITTALL METAL CASEMENT WINDOWS

MATERIAL: All bars of rolled mild steel, hydraulically straightened, and free from hammer marks, rolling flaws, or other imperfections.

WEATHERING: All types of casements are double weathered at all points.

All weathering is solid with the frames and not obtained by the use of screwed-on fillets or strips.

SECTIONS: The size of section is determined by the size of the window.

The casements are prepared for glazing from the inside, with either metal or wood beads, unless otherwise specified. [The beads themselves are an extra.] Windows can be made to glaze from outside [with putty] if preferred.

SIGHT AND GLASS LINES: Whether opening or fixed, the sight lines of all windows of the same section are the same, and the glass is in the same plane.

JOINTS AND CORNERS: All corners of frames and brackets for fittings welded, no brazing being used for any purpose.

HINGES: Solid drawn Gunmetal Hinges, with steel pins on all types of casements, except Centre-Hung, which are hung on phosphor bronze centres.

FINISH: *All windows are entirely freed from scale and rust by sandblasting, at an early stage in manufacture, before fittings and hinges are applied. They are painted immediately after sandblasting, and a final coat of priming paint applied when the windows are complete.*

FITTINGS: All fittings are of our own manufacture and are interchangeable.

ERECTION AND DESPATCH: All windows are supplied with the necessary lugs and screws for fixing, and when intended for shipment are packed in close boarded cases.

SPECIAL NOTE

The Application Details on pages 28-33 show MEDIUM Section Casements

SPECIFICATION



REBATED Coupling
and Weather Bar

EQUAL Sight and
Glass Lines for all
Types of Windows

WELDED Corners

SOLID Gunmetal
Hinges with Steel
Pins

SOLID BRONZE
Handle kept at
constant tension with
Strong Steel Spring

BRACKET welded
to Frame

METAL or Hard
Wood Beads attached
on the INSIDE with
Gunmetal Screws
[See page 14]

PEG STAY and
Tapered Peg

ALTERNATIVE
with non-projecting
Sliding Stay

SECTIONS



THE UNIVERSAL SECTION which has now been generally adopted is too well known to require any lengthy description. The general form of the section is that of an **I** beam, which combines maximum strength with a minimum weight of metal. All superfluous mouldings and weather checks [mostly only practical on paper], have been eliminated, and weather-tightness is obtained by the accurate contact of surfaces.

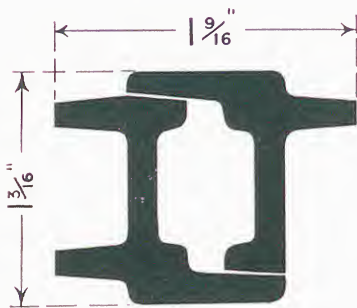
ALL TYPES of ventilators have exactly the same appearance, and all windows of the same section the same sight lines.

GLAZING can be either internal or external.

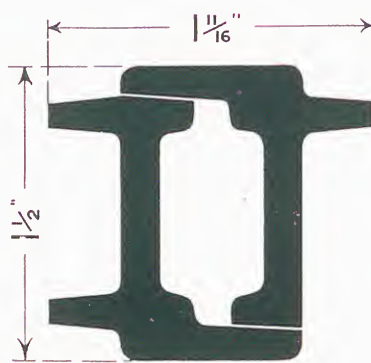
OUR STANDARD PRACTICE is to make all windows to glaze from the inside, as the glass is more readily installed or replaced [especially in high buildings] when so constructed.

WINDOWS of any practical size or type can be produced from these sections, and the size of section used is governed by the size of the opening.

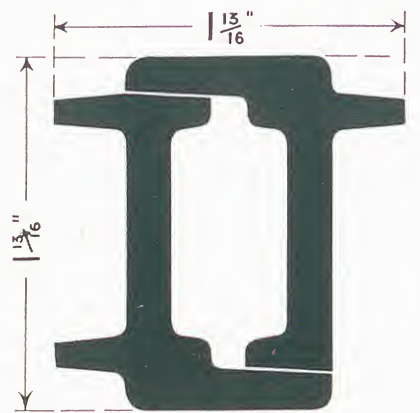
WHEN one size of section [or sight line] is required throughout any building, it should be specially called for.



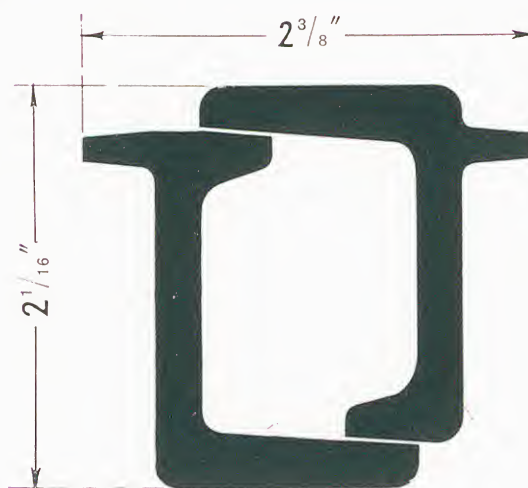
SMALL SECTION



MEDIUM SECTION



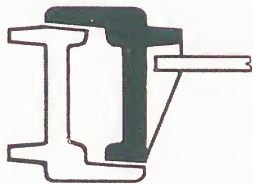
LARGE SECTION



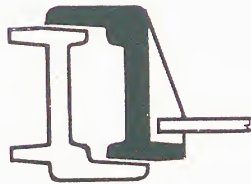
SUPER LARGE SECTION

DETAILS

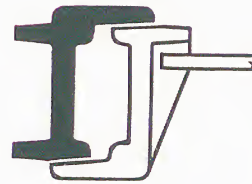
SECTIONS USED IN CRITTALL METAL CASEMENT WINDOWS



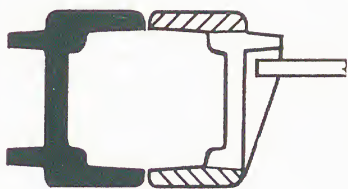
No. 195, 295, 395
Opening Frame. For Glaze in,
open out ; for Glaze out, open in



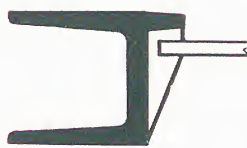
No. 196, 296, 396
Opening Frame. For Glaze out,
open out ; for Glaze in, open in



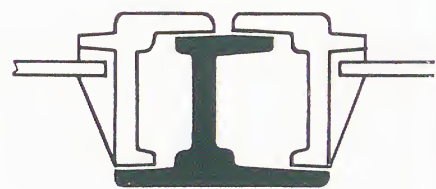
No. 197, 297, 397
Fixed Frame for all
Opening Casements



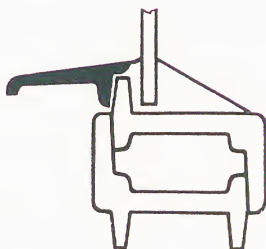
No. 198, 298, 398
Parent Section for all
Pivoted Bars, Open-
ing or Fixed



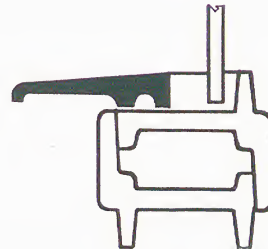
No. 199, 299, 399
Fixed Lights



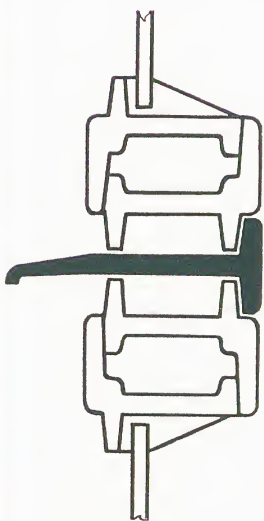
No. 194, 294, 394
Fixed Meeting Rails



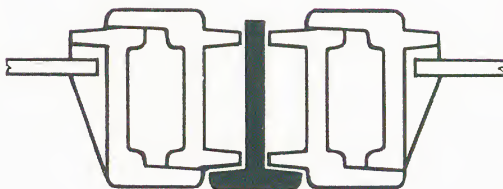
No. 157
Cill-weather Bar for
Inward-opening Case-
ments, Glazed inside



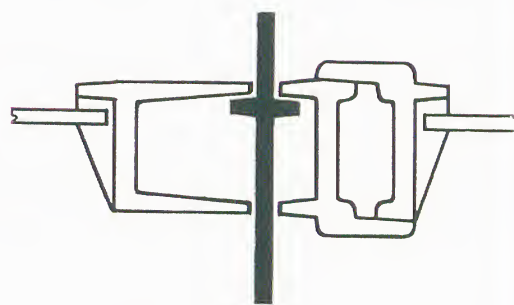
No. 106
Cill-weather Bar for
Inward-opening Case-
ments, Glazed outside



No. 110
Horizontal Connecting Bar
(Transome) used over Out-
ward-opening Casements



No. 303
Vertical Connecting Bar
(Mullion) or Transome
over Inward-opening
Casements



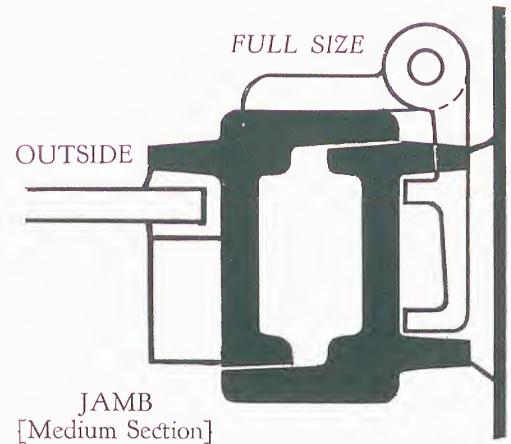
No. 101
Connecting Bar for large
Composite Windows
(Mullion or Transome)

TYPES OF VENTILATORS



OUTWARD OPENING CASEMENTS

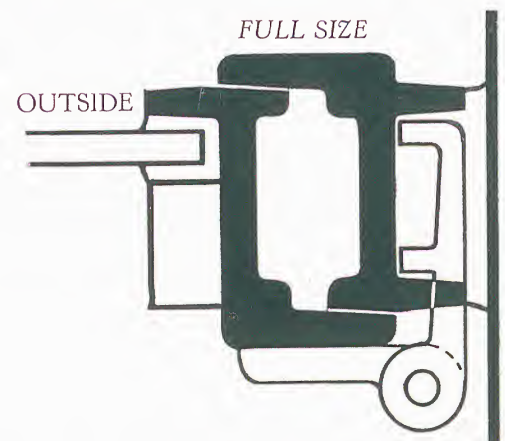
Hung at Side or Top



INWARD OPENING CASEMENTS

Hung at Side or Bottom

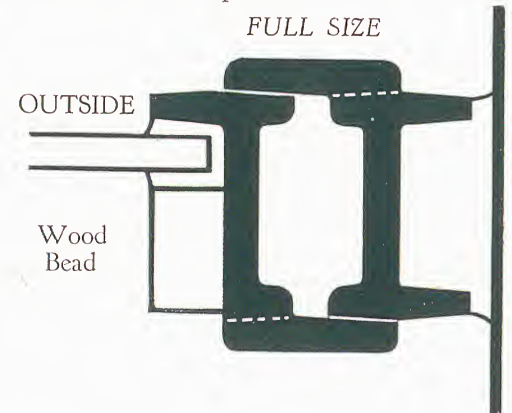
Bottom-Hung Casements can be provided with glazed side cheeks to prevent draught



CLEANING CASEMENTS

Pivoted Vertically or Horizontally

NOTE.—In Vertically-Pivoted Windows our standard practice is to open one-third inwards, unless otherwise specified



GENERAL NOTE.—All sections are shown in the medium size. For preparation of masonry, see pages 28-33

TYPES OF VENTILATORS



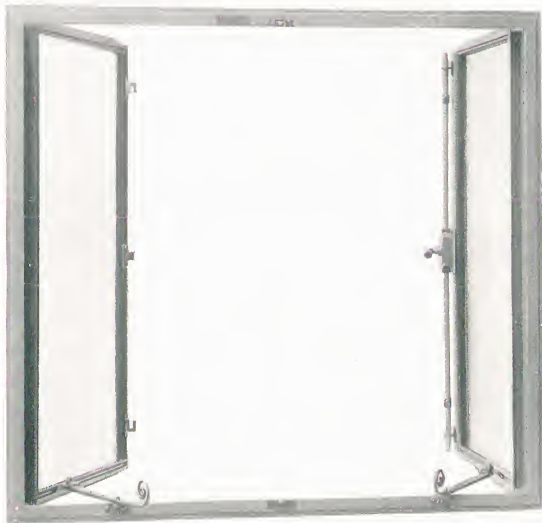
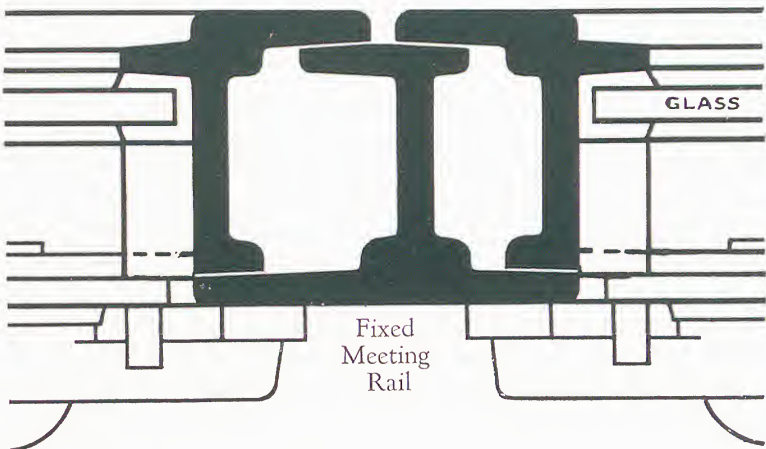
FOLDING CASEMENTS

MADE TO OPEN OUTWARDS OR INWARDS

[With Fixed Meeting Rail]

FIXED Meeting Rails are advisable on high buildings for reasons of safety

FULL SIZE

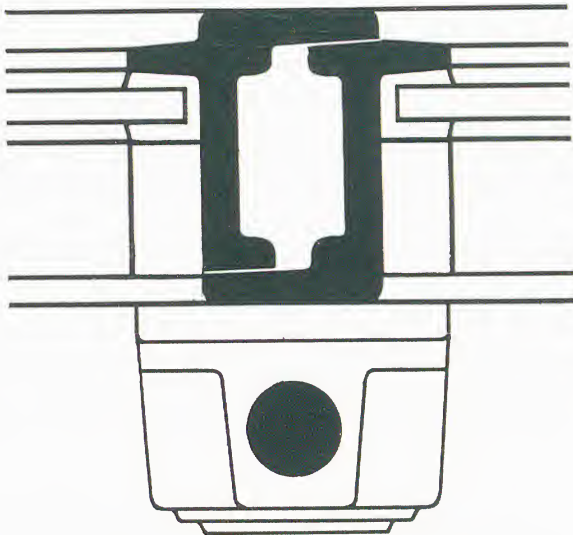


FOLDING CASEMENT

MADE TO OPEN OUTWARDS OR INWARDS

[Without Fixed Meeting Rail]

FULL SIZE



Espagnolette Bolt Meeting Rail

FOLDING DOORS AND



OPENING OUTWARDS



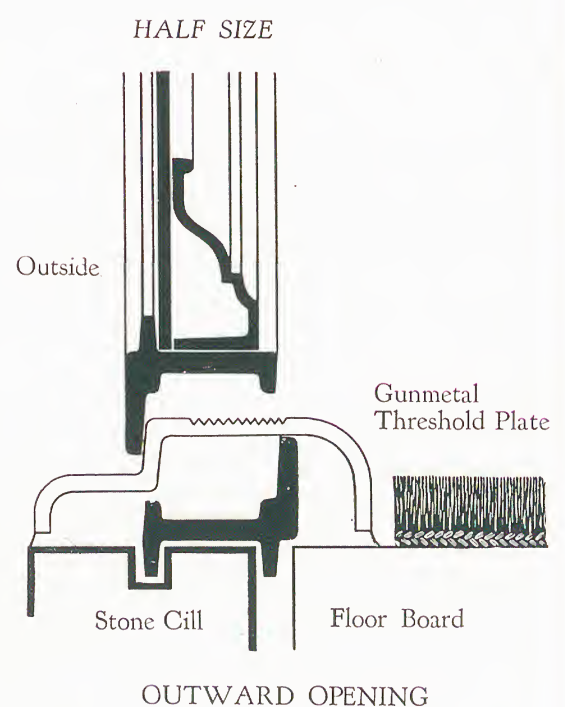
THRESHOLDS

ALL doors should have a solid gunmetal threshold as shown. This provides a draught check, and is grooved to prevent slipping.

KICKING PLATES

FOLDING Doors and French Windows opening either outwards or inwards are usually provided with a solid kicking plate.

Made of solid metal this is generally about 6" to 9" deep, and may be panelled with solid moulding of selected design.



FRENCH WINDOWS

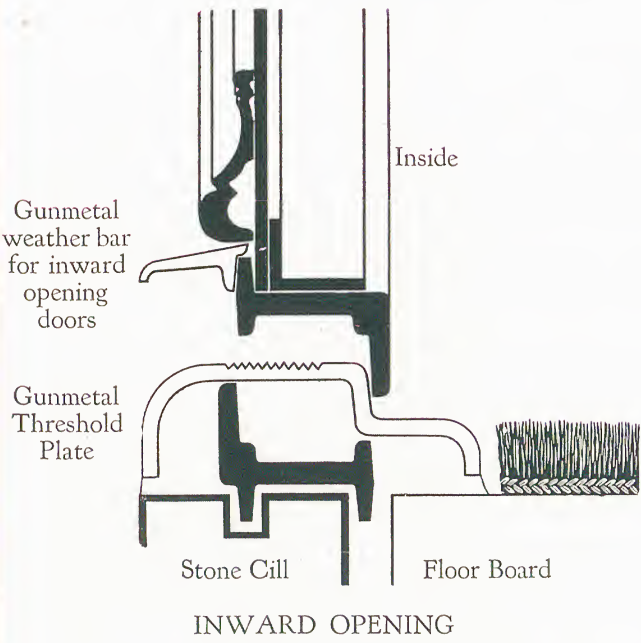


OPENING INWARDS



HALF SIZE

FITTINGS



NOT being required for traffic purposes, French Windows are generally fitted with espagnolette bolts, to be operated from inside, which can be made to lock if desired.

Folding Doors which require to be operated from both sides are provided with a lock of mortice pattern, as illustrated above.

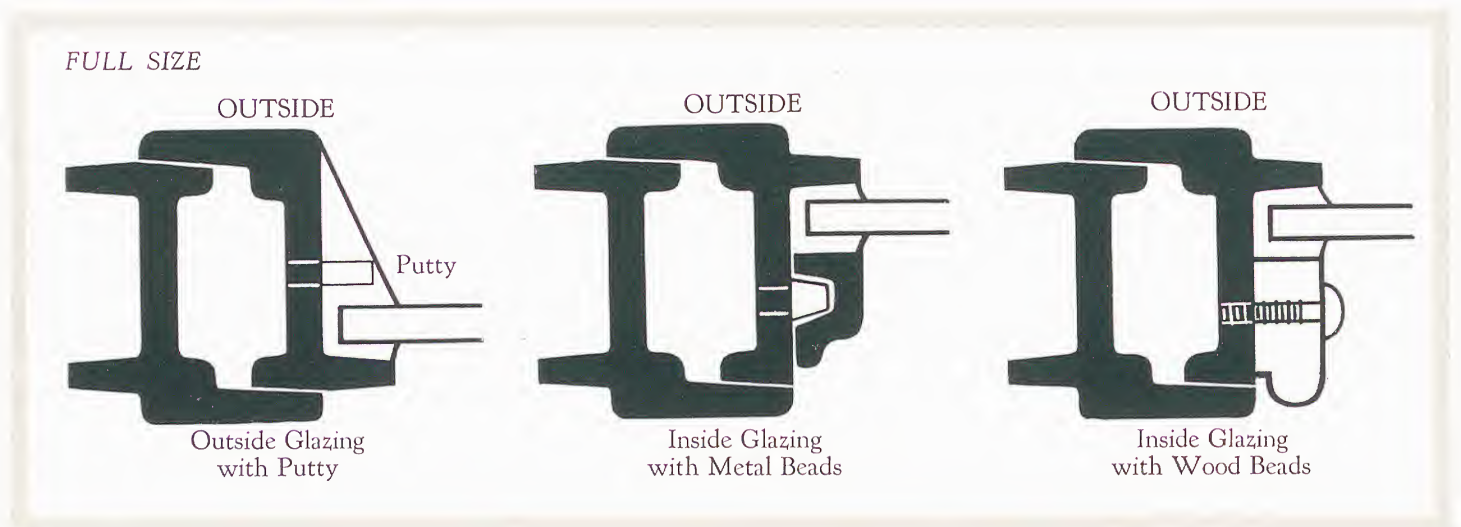
Cabin hook fasteners can be fitted to hold doors open.

INTERNAL or EXTERNAL GLAZING



ALL UNIVERSAL CASEMENTS can be made to glaze from inside or outside without affecting the price or detail. We generally advocate glazing from the inside for the following reasons:—

1. In high buildings glass can be fixed or replaced from inside without extensive or dangerous use of slings or ladders.
2. The solid metal face is exposed to the weather.
3. Metal beads are unsatisfactory externally on account of corrosion.
4. Wood beads which would be impracticable outside can be advantageously used inside.



OUTSIDE GLAZING WITH PUTTY

IN cases where internal effect only has to be considered, such as in hospitals, main staircase windows, and restaurants, outside glazing is suitable. The glass must be properly bedded, and a good quality of putty used. Copper spriggs are most suitable for such cases. We do not recommend any form of bead for outside glazing. Putty glazing is not advisable in tropical countries.

METAL BEADS

ALL exceptionally large sheets of glass in opening casements should be reinforced with metal beads. They are an extra

precaution in fireproof buildings. Brass screws are used for attaching metal beads, to avoid the danger of corrosion.

WOOD BEADS

FOR general use, wood beads are the most satisfactory internal finish. They are supplied in teak, and are attached with brass screws. *Any form of moulding can be adopted*, but a round edge as shown is the standard section. They are considerably cheaper than metal beads, and although slightly more expensive than putty, provide a much more pleasing finish.

Casements can be supplied with beads, or they may be prepared for receiving the beads, which can be supplied by the general contractor.

CONDENSATION GUTTERS

CASEMENTS have often been pronounced not water-tight because water is found on the cill board. In nearly every case this is due to sweating, common to all new buildings.

Once the building is internally heated this will soon disappear, and condensation will only occur when the internal temperature is subject to variation.

In centrally heated buildings, where the temperature is constant, this difficulty is not serious.

As all accumulated moisture eventually reaches the cill it is advisable, in cases where this is likely to occur, to protect this part of the window with a channel of non-corrosive material, to collect the condensation and prevent it from running over the cill board.



FULL SIZE

OUTSIDE

Gunmetal
Condensation
Gutter

OUTSIDE

Gunmetal
Condensation
Gutter

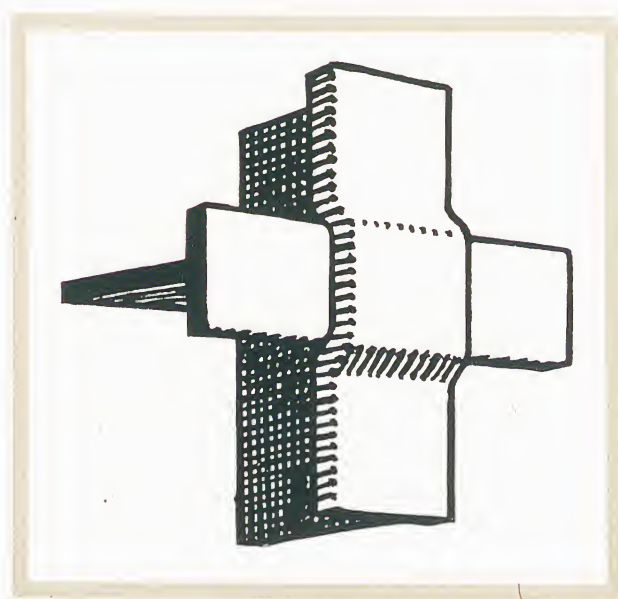
GLAZING BARS



METAL WINDOWS are divided into panes for the following reasons:—

1. To conform to some architectural effect.
2. To economize in glass.
3. To make them burglar-proof.
4. To stiffen the opening frame.

The 'Fenestra' method of intersecting glazing bars is essentially 'metal' in appearance, and is undoubtedly considerably stronger than the mitred joint. The Tees are supplied in four-sight widths, $\frac{3}{4}$ ", $\frac{7}{8}$ ", 1", and $1\frac{3}{8}$ ", to suit varying styles of architecture.



GLAZING BARS



BRITANNIC HOUSE, FINSBURY CIRCUS, E.C.

Architect : SIR EDWIN L. LUTYENS, R.A.

THE beautifully proportioned window openings are considerably enhanced by the use of Fenestra jointed glazing bars.

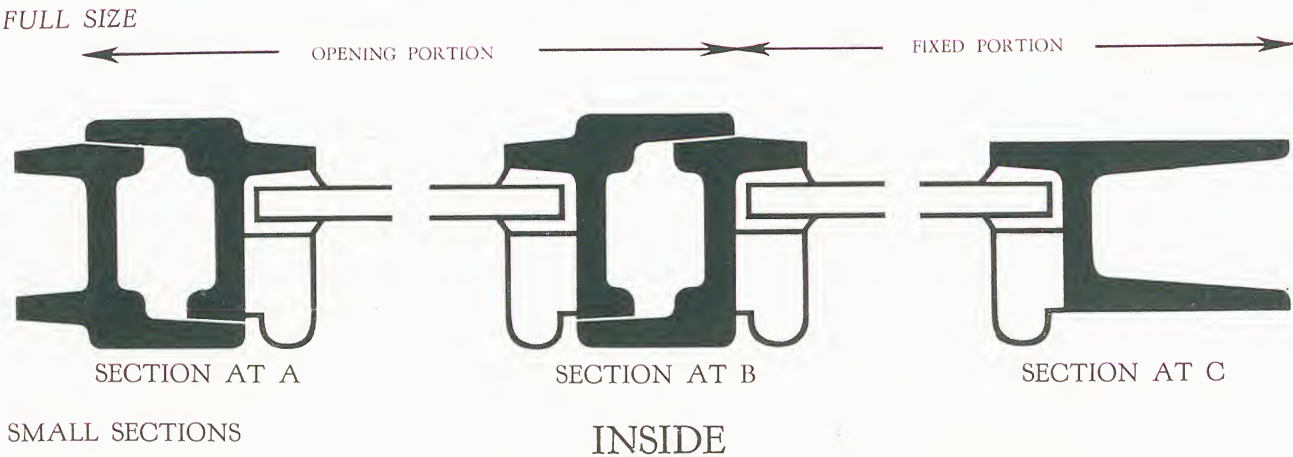
The panes in all the openings are of the classical proportion of the height, being equal to the diagonal of the width.

Hardwood glazing beads finished in ebonite are used throughout instead of putty.

COMPOSITE WINDOWS

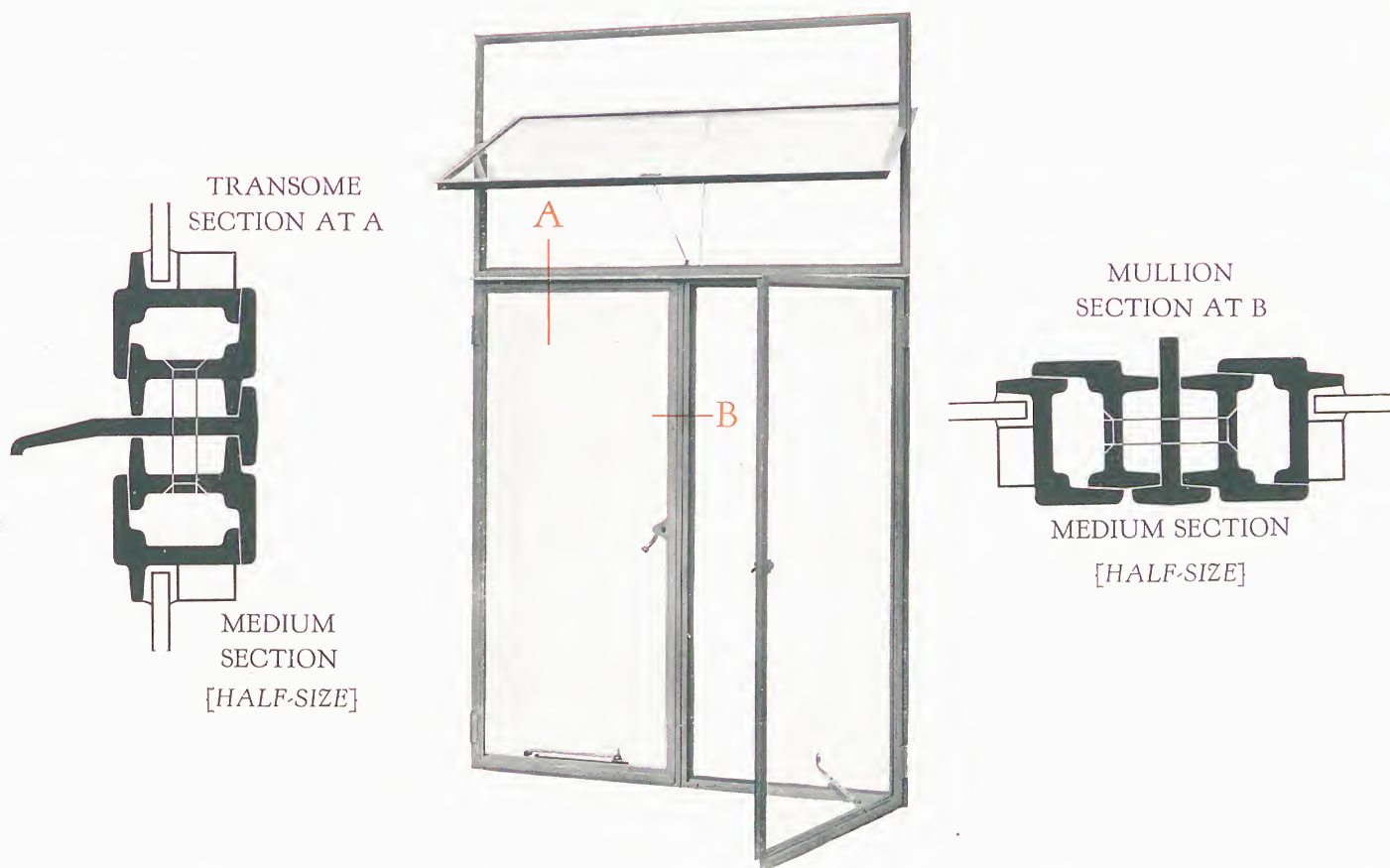


GLAZE AT SIDE



THIS detail is used in all cases where only a portion of the window is required to open. It is applicable to any type of ventilator, and the fixed portion may be on any side of the opening portion. It may be used in conjunction with any other coupling details.

COMPOSITE WINDOWS



ANY number of casements of any type may be coupled together to form composite windows, by the use of Metal Tee coupling bars.

This method offers much less obstruction to light than either wood or stone mullions, and provides a metal check or rebate to break the joint.

The coupling is effected by means of bolts concealed inside the section [and thus not affected by rust]: this allows windows of any size to be shipped in small units and erected on the site.

In cases where the mullions and transomes intersect both bars are continuous, the mullion being threaded through the transome. This greatly increases the rigidity of the complete window.

The joint between the casement and the coupling bar must be pointed with mastic cement after fixing.

COMPOSITE WINDOWS



WROUGHT MULLIONS AND TRANSOMES IN STEEL OR BRONZE



QUARTER
SIZE



Mullion &
Transome

NORTH CHINA DAILY NEWS, SHANGHAI
Architects: LESTER, JOHNSON & MORRIS

FOR plain panelled mullions and transomes, where a wider line is required than that produced by the standard tee coupling, this detail is used, and can be elaborated by substituting rolled steel mouldings of various profiles in lieu of the plain sunk-panel effect shown.

We are able to make up mullions and transomes of any width which architects may desire.

The windows and mullions shown above are made of solid bronze sections.

COMPOSITE WINDOWS



CAST IRON FRAMING



HARVEY, NICHOLS & CO. LTD., SLOANE STREET, S.W.
Architects : WILLIAMS & COX

CAST and wrought iron panelling and framing is frequently used in modern buildings in place of stone or terra-cotta to fill the space between the windows on the various floors.

These materials lend themselves to a great variety of treatment, and a considerable saving may be effected by their proper use.

COMPOSITE WINDOWS



METAL WINDOW BACKS Between Floors



BRUNNER MOND & CO. LTD., SHANGHAI

Architects: GRAHAM-BROWN & WINGROVE

IN these constructions the substitution of metal panels in place of masonry between the floors effects considerable economies. The panels can be used to support radiators, and we have supplied them perforated and provided with 'hit-and-miss' ventilators so that ventilation through the radiators can be obtained.

COMPOSITE WINDOWS



COMPLETE METAL FRONTS



F. W. WOOLWORTH & CO. LTD., LIVERPOOL

FOR buildings of permanence or architectural importance, bronze is fundamentally the logical material for doors and windows.

Bronze, being free from corrosion, does not require periodical painting; it is a material essentially suitable for expressing the modelling of the sculptor.

In the above example the whole of the central portion is of metal, the enriched features being of solid bronze.

Further examples of bronze doors and windows are shown in another part of this catalogue.

THE ZINCSPRA PROCESS



FOR RENDERING METAL WINDOWS AND DOORS PERMANENTLY RUSTPROOF

THE principal objection that is generally raised against the metal window as compared to the wooden one is the liability to rust, and it must be admitted that under ordinary conditions there is some truth in the argument.

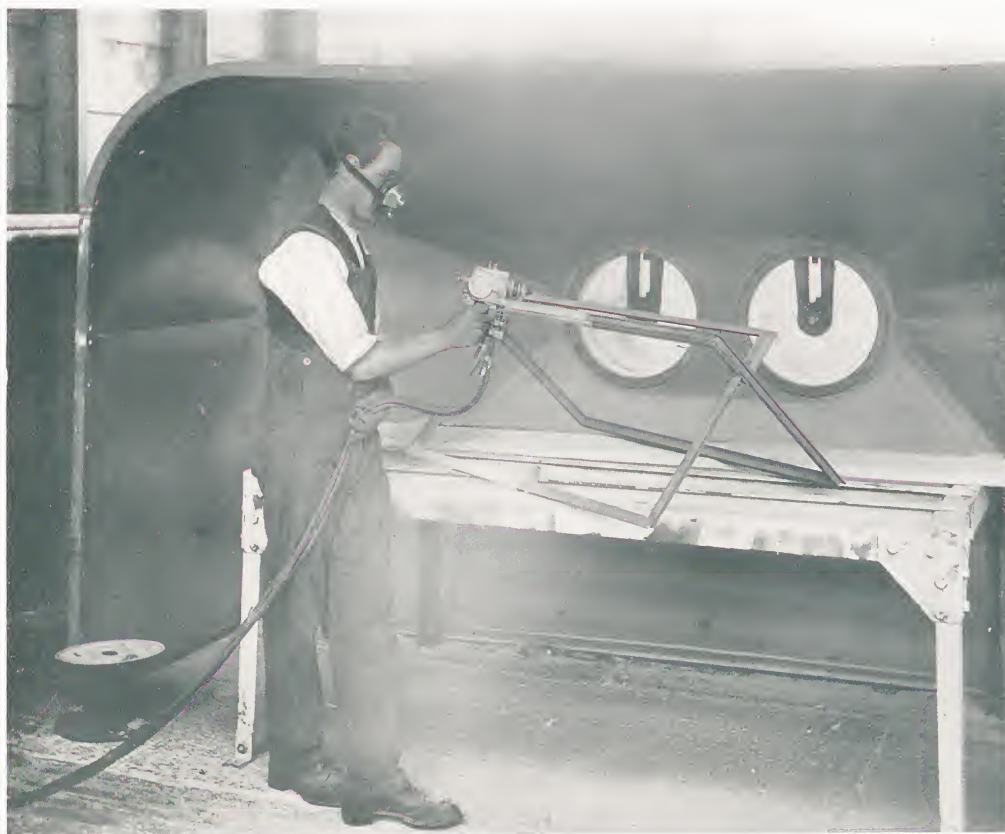
A wooden window, although it may badly require paint, does not look so ugly as a rusty metal window. The latter, though rusty, will still function, whereas the wooden window, unless it is painted, will become rotten and cease to work, and eventually the joints and hinges come apart.

We have always been aware of this difficulty, and have taken the greatest care to meet this criticism by thoroughly sandblasting our windows before painting them. This we have found to be quite efficacious up to the point when the paint requires renewing through it having volatilized. Unfortunately, however, this repainting is not always done until rust has appeared.

Various so-called rustproofing processes have been tried from time to time, but all have proved to be more or less unsatisfactory, so much so that it was with a great deal of diffidence that we adopted the Zincspra Process.

The process consists in the first place of thoroughly cleaning the metal frame by means of sandblasting. Besides getting rid of all scale, dirt and rust, this provides a 'key' to the surface of the metal.

THE ZINCSPRA·A· PROCESS



THE metal coating is applied in the form of a vapour, as shown in the above illustration. Zinc wire is fed into the 'pistol' by means of a small air-driven turbine; coming into contact with an oxy-coal gas flame the wire is liquefied, and, passing through an atomiser, emerges in the form of a vapour. When this vapour touches the cold metal bar to which it is applied it immediately solidifies and forms an impervious coating of zinc, which it is impossible to remove owing to the 'keyed' surface of the sandblasted steel.

The sprayed surface may be finished any colour with two coats of paint instead of four, as would be the case with windows treated with ordinary priming paint. Painting, however, is only required for appearance, the Zincspra being a permanent protection against rust. We have seen examples of metal so treated which have been half buried in the ground for more than six years, and which were entirely free from rust.

The saving effected by this process in eliminating subsequent painting far outweighs the small initial extra cost.

FIXING & GLAZING



INTRODUCTION

THE three fixing details shown on the following pages cover practically every form of building construction. They have been tried out in actual practice in all classes of buildings over a period of many years, and have proved to be sound from every point of view.

THE TYPE OF CASEMENT

IN each detail the fixed and opening frame of the casement are shown as one, the idea being that the building detail remains unaltered, whether the casement opens outwards, inwards, or on centres, or when it is a fixed frame (i.e. not to open).

THE SIZE OF SECTION

THE size of the section must be governed by the opening to be filled, or by the size of the sub-divisions of each opening. In these details the medium section has been shown.

FIXING

GENERALLY speaking, the erection of metal windows should be left until all the rougher trades have left the site and the openings are ready for glazing.

Where this is impossible, care must be taken to see that the windows are not damaged by placing scaffold boards on the cills, or drawing heavy objects through them. It is also advisable to detach all fittings until the building is finished, and store them away.

Before any paint is applied to windows they must be thoroughly cleaned of cement, plaster, or other refuse.

The satisfactory working of any metal casement depends upon how it is fixed, and we generally prefer to undertake this ourselves whenever possible. In cases where this is impossible, the fixing instructions accompanying each detail in this book should be carefully followed. It is impossible to construct a metal window which cannot be spoiled by bad fixing.

DIMENSIONS

PARTICULAR attention is called to the method of indicating how dimensions should be given on the various details. We always provide the necessary clearance.

GLAZING

SPECIAL instructions as to glazing metal casements will be found on page 27. Special attention is called to these, as satisfactory results are largely dependent upon this work being properly carried out.

FIXING & GLAZING

OUTSIDE OR INSIDE GLAZING

CRITTALL Metal Casement Windows can be glazed from the inside or outside. We recommend inside glazing, unless there is some particular reason to the contrary.

GLAZING BEADS OR FILLETS

METAL Glazing Beads are advisable for large sheets of glass, as they are more substantial than sprigs and front putty, and assist to reinforce the frame.

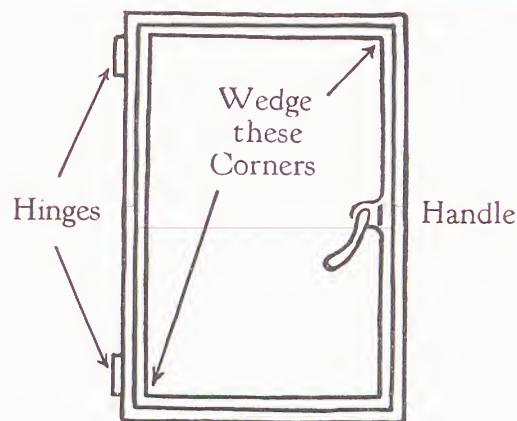
Where inside glazing is used, metal or wood beads are often specified instead of putty for the sake of internal appearance, in which case the beads should be bedded in putty and pressed firmly against the glass.

TIGHT GLASS

TO prevent breakage, care should be taken to see that there is plenty of clearance between the glass and the frame. In giving glazing sizes, $\frac{1}{8}$ in. all round must be allowed.

WEDGING GLASS

IN glazing Crittall Metal Casement Windows it is essential to see that the weight of the glass is thrown towards the hanging side of the casement. In order to do this, the opening frame should be slightly levered up on the shutting side, and wedges inserted in such a position as to throw the weight of the glass on the



bottom hinge. The lever can be removed when it has been ascertained that the glass is firmly wedged between the lower hinge corner and the top shutting corner.

PUTTY

GLASS must never be placed against the metal rebate. Whether glazed from the outside or inside, the rebate must be covered with a thin layer of putty, and the glass pressed firmly against it.

Where glazing sprigs are used, a wooden wedge should be placed between the sprig and the glass before applying the front putty. This is to insure that the glass is firmly held without fear of breakage.

PUTTY SPECIFICATION

ORDINARY glazier's putty is not suitable for glazing metal windows, as the steel frame will not absorb the excessive quantity of oil.

It is necessary to see that only linseed oil is used (in sufficient quantity to allow the putty to be worked without being sticky). A little mastic cement or red lead mixed with the putty will add considerably to its strength and permanence.

A P P L I C A T I O N



TO BRICK, STONE, OR PLASTER, WITH INTERNAL FINISH

DETAIL No. 1

THIS detail has the advantage of showing the whole face of the metal, and has the same internal and external appearance. The fixed frame of the casement has a deep channel, which provides an excellent key for the cement joint between metal and masonry. Margin is made for inaccuracy in masonry, and an excellent bond provided for internal finish. The depth of rebate for tiles or plaster should be about $\frac{3}{4}$ in., and, if wood lining or furring is used, this should be increased.

This is the most economical method of applying metal windows, as no framing is necessary, and all cutting of rebates is avoided.

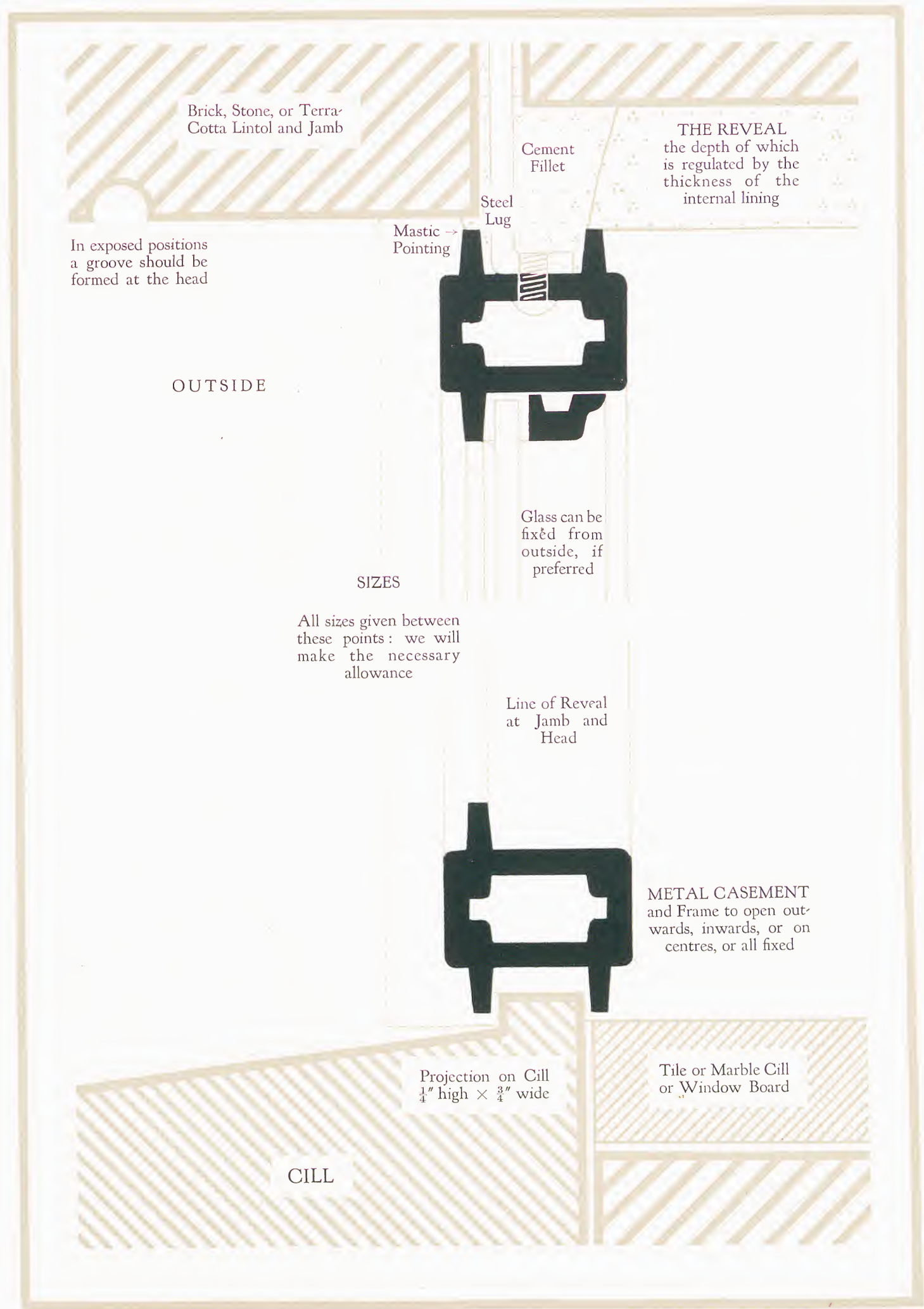
FIXING INSTRUCTIONS

1. The window must be placed over the stool formed on the cill, care being taken to see that it is level and free from dirt. In case of very wide side-hung ventilators, it is advisable to slightly wedge up the hinge side.
2. Windows must be adjusted by means of wedges, care being taken not to distort the frame, and all ventilators must be tested to ascertain that they open and close accurately, after which all ventilators should be closed and securely fastened until ready for glazing.
3. Lugs cemented into masonry. This must not be done until the window is properly adjusted. Care must be taken to see that lugs are free from masonry and not touching anywhere.

The best plan is to entirely remove internal bricks opposite lugs, and re-lay in hard cement. The lugs are attached by bolts to the frames, and can be fixed either flat or on edge.

4. When lugs are firmly cemented and set, the wedges may be removed and the space between masonry and frame filled with cement. Care must be taken to see that a sound cement joint is made, after which the frame must be pointed up outside with mastic cement.
5. When firmly cemented and pointed, the internal plaster, tiles, or wood lining can be applied.
6. Generally, care must be taken to prevent distorting frames by other trades placing boards or poles on cills, transoms, or glazing bars.

FIXING DETAIL No. 1



A P P L I C A T I O N



TO RENDERED BRICK or CONCRETE OPENINGS

DETAIL No. 2

THIS method of application is almost universal in all countries where building stone or fine quality bricks are unobtainable.

In buildings of this kind, the rough nature of the masonry requires that the frames should be made considerably smaller than the openings into which they are to be placed, the difference being made up with cement rendering, for which an excellent key is provided by the channel all round the metal frame.

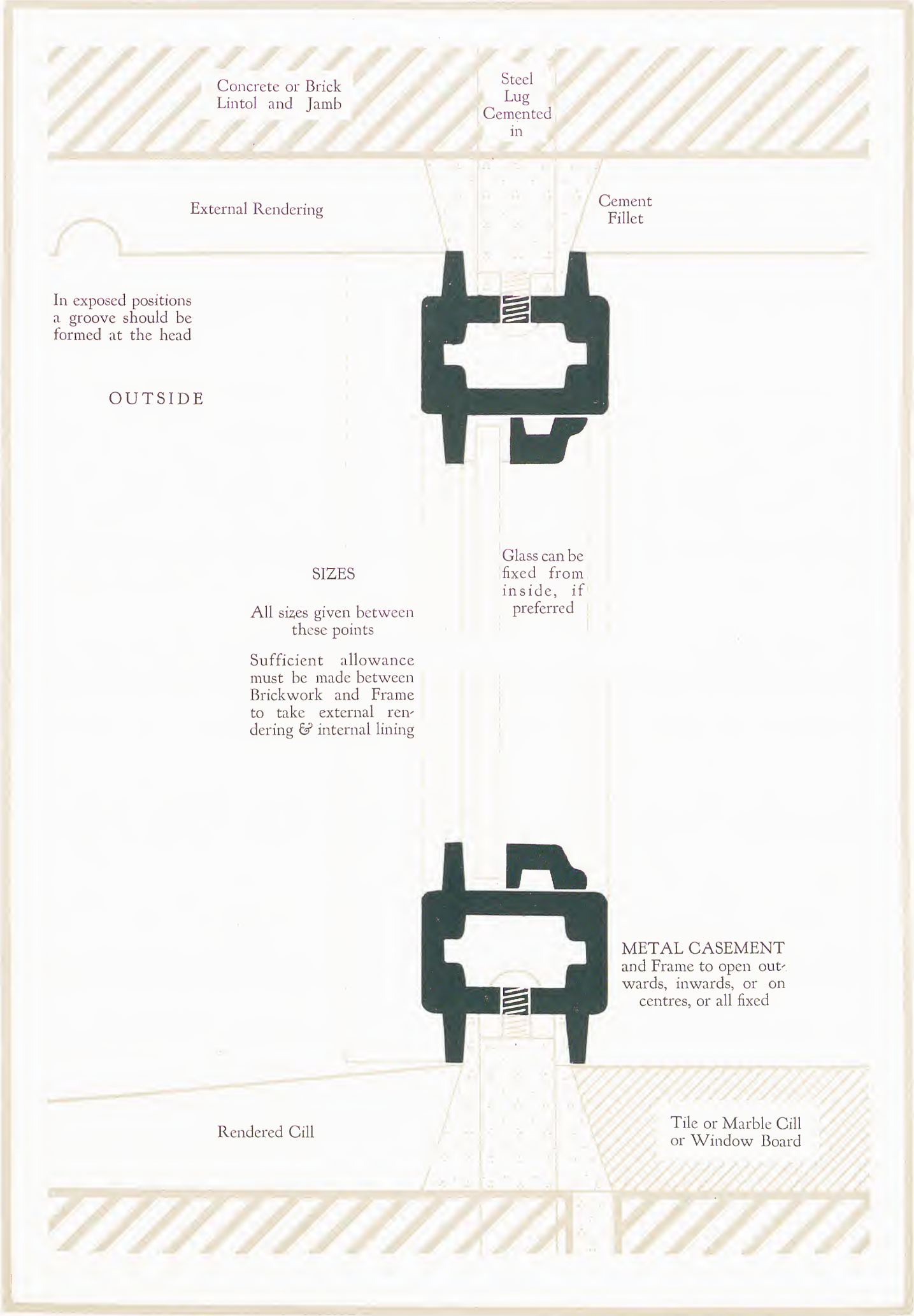
It is most important to see that in applying this cement rendering, the metal frame is not distorted, as it is not easily adjusted once it is fixed.

Provided the following instructions are carefully followed, no difficulty will be experienced, and the windows will always operate satisfactorily.

FIXING INSTRUCTIONS

1. The window must be placed on wood blocks laid on the cill, and, having ascertained that it is perfectly level and upright, and free from twist, it should be secured in its place with wooden wedges at the sides and head. These blocks and wedges must not be removed until the lugs and mullions [where windows are in more than one part] are firmly cemented in their place. All opening portions should be tested to ascertain that they open and close accurately, and should then be closed and securely fastened until ready for glazing.
2. As it has been found impossible to completely standardize the positions of fixing lugs, owing to the variations in size and type of windows, it is not proposed that provision should be made beforehand, either by building in fixing blocks or leaving out bricks. It is a comparatively simple matter to remove the bricks opposite each lug when the windows are ready for fixing. Care must be taken to see that the lugs are free from the masonry before being cemented in. In the case of concrete openings, either holes can be cut opposite lugs, or a continuous groove formed all round the opening, into which lugs can project.
3. When the lugs are firmly cemented and set, the wedges and blocks may be removed and the space between masonry and frame filled with cement. This can best be done by placing along the frame, outside, a wood spline, and throwing the cement in with a trowel, taking care to see that the channel is well filled.
4. When the cement fillet is properly set, internal and external plaster may be applied.
5. Generally, care must be taken to prevent distorting frames by other trades placing boards or poles on cills, transomes, or glazing bars.

FIXING DETAIL No. 2



A P P L I C A T I O N



TO REBATE OPENINGS IN BRICK, STONE, OR WOOD

DETAIL No. 3

THIS is the detail usually associated with mullioned openings [and leaded glass], and has hitherto been accepted as the correct method of preparing work to receive metal casements.

It is, however, limited to certain types of buildings, and is not suitable where internal linings come in direct contact with the metal frame.

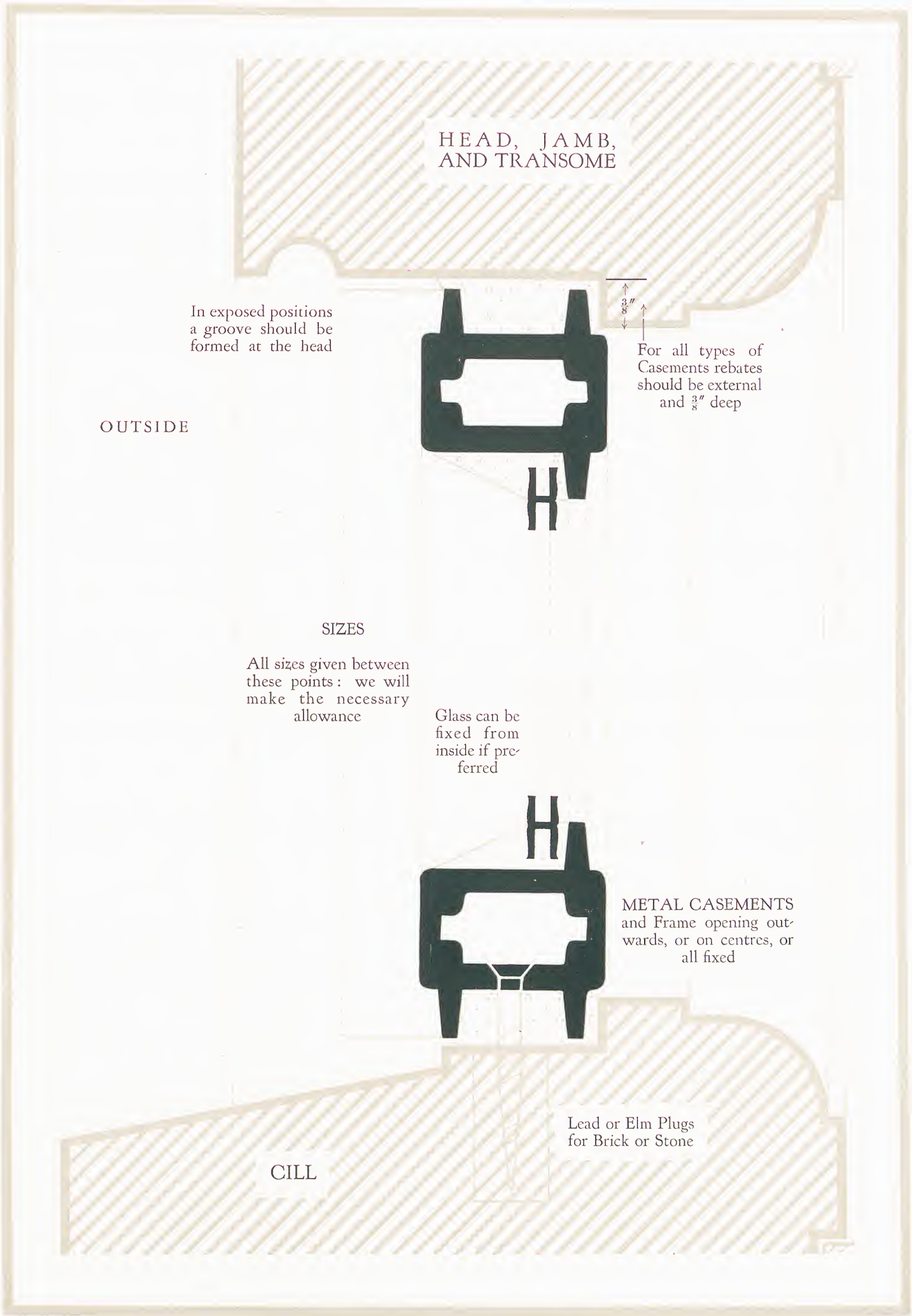
The correct method of preparing all such openings, whether the window opens outwards, inwards, or on centres, is with a $\frac{3}{8}$ " external rebate.

We most strongly recommend plain rebating in preference to grooves, wherever it can be applied.

FIXING INSTRUCTIONS

1. Place the frame in the opening to ascertain that it will go in without straining; a casement should never be forced into an opening which is too small for it.
2. Remove frame, and drill or cut holes in brick or stone for plugs. No plugs are required for wood framed openings.
3. Plugs should fit tightly in holes, but not be driven in, otherwise masonry will crack when screwing up.
Lead must not be poured in.
4. Bed the rebate with mastic cement all round, and then put casement into opening, pressing it firmly against the rebate. Fix the top screw only to hold frame in position while adjusting.
5. Open and close ventilator to see that contact is made all round.
This can be adjusted by small wedges between rebate and outer frame.
6. Screw frame to plugs, taking care not to distort the frame by tightening one screw more than another.
7. Point up between rebate and frame all round.
The frame is then ready for glazing.
8. Generally, care must be taken to prevent distorting frames by other trades placing boards or poles on cills, transoms, or glazing bars.

FIXING DETAIL No. 3





REQUIRED WITH ORDERS AND ENQUIRIES

IN order to avoid delay and obtain prompt attention, particular attention should be given to the following queries before forwarding orders or enquiries:

- 1
Exact height and width of opening, giving height first. This should be accompanied by sketch showing where measurements are taken from, and giving a full-size section through head, jambs, and cill.
- 2
State of what materials the openings are formed, and amount of allowance to be made from sizes given.
- 3
If circular or shaped openings, full size templates must be furnished or radius given.
- 4
Type of ventilator required. State which hand. If folding casements, state whether meeting rail is required or not.

NOTE.—The hand of a Casement is the side on which the hinges are, looking from inside.
- 5
When composite windows are required [i.e. when part only is to open, or when two or more types of ventilators are combined in one opening] sketch must be sent showing type of ventilators and position of mullions and transomes. State if mullions and transomes are of wood or stone.
- 6
Exact thickness and quality of glass.
- 7
Whether to be glazed from inside or outside.
- 8
Positions of saddle-bars if lead glazing is used.
- 9
Whether glass will be fixed with putty, wood beads, or metal beads.
- 10
Number of panes, if any, into which casement is to be divided.
- 11
Sight width of glazing bar: $\frac{3}{4}$ ", 1", or 1 $\frac{3}{8}$ ".
- 12
State exact type and number of fittings, and whether to be in malleable iron or gunmetal.
- 13
State for what class of building the windows are required, the condition of the building at time of ordering, and whether openings will be made to suit the casements.
- 14
Give full shipping directions, name of consignee, at which station delivery is to be made, and date of delivery wanted.
- 15
Give name and address of party to whom goods are to be charged.

MAXIMUM SIZES

TO WHICH ‘UNIVERSAL’ CASEMENTS CAN BE MADE WITHOUT REINFORCEMENT



THE size of section used is determined by the size of opening to be filled, or by the largest ventilator.

In no case are two sizes of section used in one opening, but if one size of section is required throughout any building, elevation, or room, irrespective of the size of

opening or ventilator, it must be specially called for.

Sizes of Casement to be arrived at by adding together twice the height and twice the width, e.g. one Casement $5' 0'' \times 2' 0'' = 14$.

SIDE-HUNG CASEMENTS, OPENING OUTWARD OR INWARD

Small Section . . .	14	Width not to exceed . . .	2' 0"
Medium „ . . .	17	„ „ „ . . .	2' 6"
Large „ . . .	22	„ „ „ . . .	3' 0"

TOP-HUNG CASEMENTS, OPENING OUTWARD BOTTOM-HUNG CASEMENTS, OPENING INWARD

Small Section . . .	14	Width not to exceed . . .	4' 0"
Medium „ . . .	17	„ „ „ . . .	5' 0"
Large „ . . .	21	„ „ „ . . .	6' 0"

FOLDING CASEMENTS, OPENING OUTWARD OR INWARD

Small Section . . .	18	Width not to exceed . . .	4' 0"
Medium „ . . .	22	„ „ „ . . .	5' 0"
Large „ . . .	28	„ „ „ . . .	6' 0"

VERTICAL CENTRE-HUNG CASEMENTS. [Hung $\frac{2}{3}$ width]

Small Section . . .	16	Width not to exceed . . .	3' 0"
Medium „ . . .	19	„ „ „ . . .	3' 6"
Large „ . . .	24	„ „ „ . . .	4' 6"

HORIZONTAL CENTRE-HUNG CASEMENTS. [Hung Central]

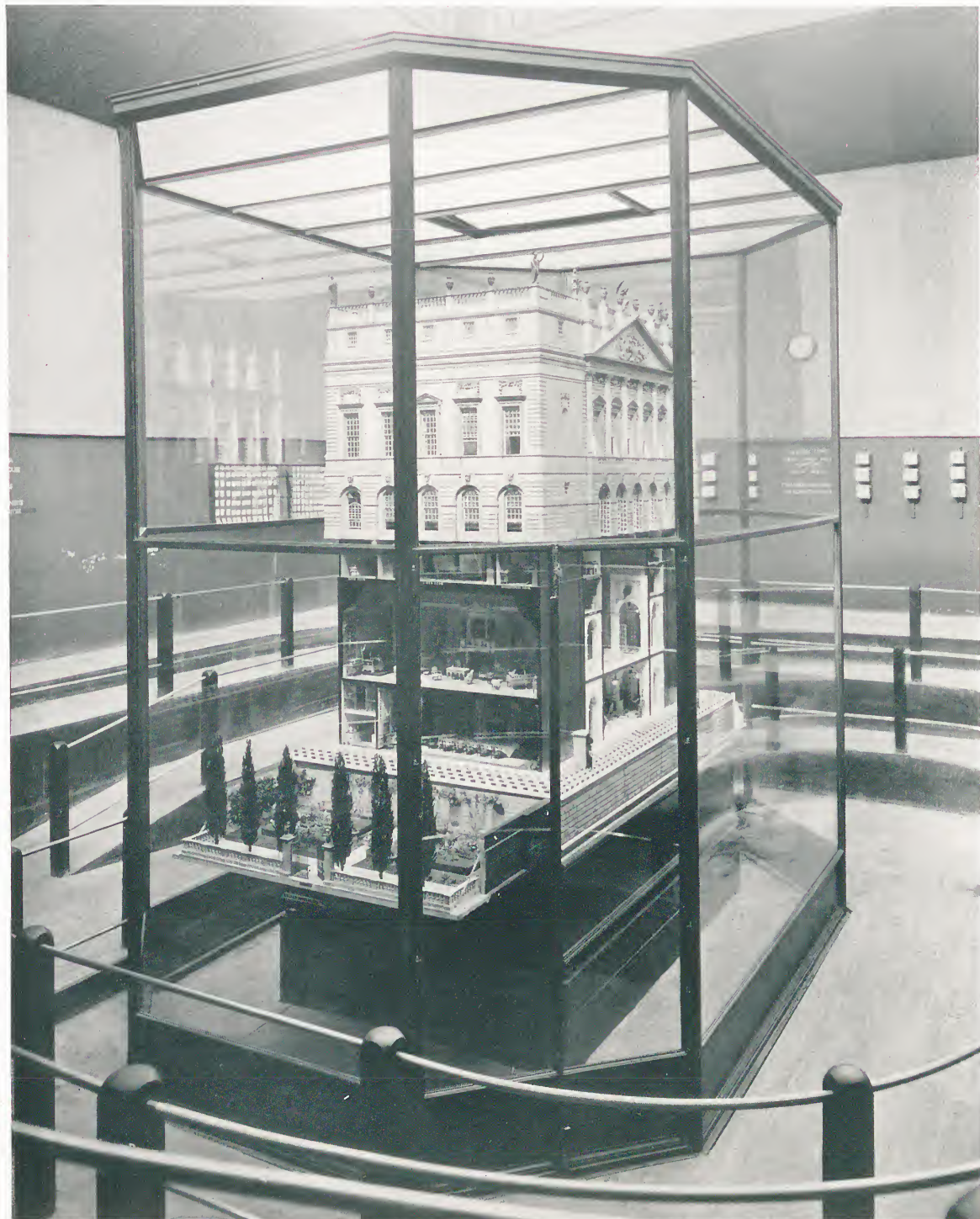
Small Section . . .	12	Width not to exceed . . .	3' 0"
Medium „ . . .	15	„ „ „ . . .	3' 6"
Large „ . . .	18	„ „ „ . . .	4' 6"

FIXED LIGHTS

Small Section	} To match any size Casement
Medium „	
Large „	

In exceeding the above dimensions, the Casements must be reinforced with glazing bars.

INSTALLATIONS



THE QUEEN'S DOLLS' HOUSE

Architect : Sir EDWIN L. LUTYENS, R.A.

This bronze case was presented by F. H. Crittall, Esq., and made, erected and glazed complete in ten days by the Crittall Manufacturing Co. Ltd.

INSTALLATIONS



GLASGOW MUNICIPAL BUILDINGS EXTENSION
Architects: WATSON, SALMOND & GRAY



MUNICIPAL BUILDINGS, ISLINGTON, N.
Architect : E. C. P. MONSON

INSTALLATIONS



ADELAIDE HOUSE, LONDON BRIDGE, E.C.
Architects : SIR JOHN BURNET & PARTNERS

INSTALLATIONS



OFFICES OF MANCHESTER LINERS LIMITED, MANCHESTER
Architect : HARRY S. FAIRHURST

INSTALLATIONS



JEWISH SYNAGOGUE, SHANGHAI
Architects : MOORHEAD, HALSE & ROBINSON



UNIVERSITY COLLEGE LIBRARY, READING
Architects : CHAS. SMITH & SON

INSTALLATIONS



THE KAILAN MINING ADMINISTRATION, TIENTSIN
Architects : ATKINSON & DALLAS



MESSRS. JARDINE, MATHESON & CO. LTD., SHANGHAI
Architects : STEWARDSON & SPENCE

INSTALLATIONS



THE LICENSES & GENERAL INSURANCE COMPANY LTD.
MOORGATE STREET, E.C.
Architects : F. W. MARKS & R. J. G. O'DONOGHUE

INSTALLATIONS

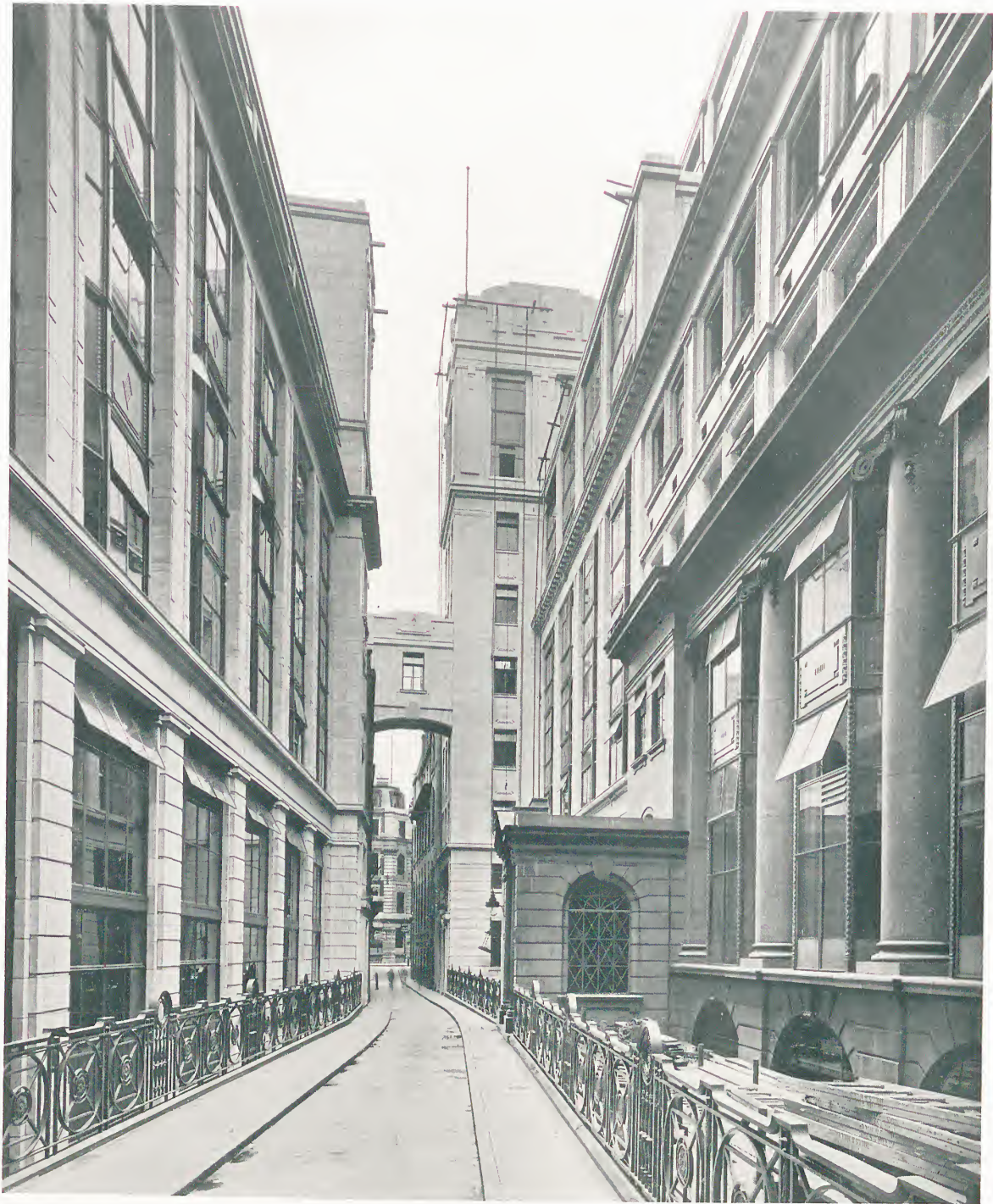


THE MERCHANTS' MARINE INSURANCE COMPANY LTD., CORNHILL, E.C.
Architects : CAMPBELL JONES, SON, & SMITHERS



THE GREAT NORTHERN TELEGRAPH COMPANY LTD. OF DENMARK
ST. HELEN'S PLACE, E.C.
Architect : H. A. SAUL

INSTALLATIONS



OFFICES IN GREAT ST. HELEN'S, E.C.
Architects : Messrs. JOSEPH

INSTALLATIONS



OFFICES IN GREAT ST. HELEN'S, E.C.
(ANOTHER VIEW)

Architects : Messrs. JOSEPH

INSTALLATIONS



RADIO STATION, KOOTWYK, HOLLAND



YEARMARKET, UTRECHT, HOLLAND

Architect : J. DE BIE LEUVELING TJEENK

INSTALLATIONS



TELEGRAPH OFFICE, ARNHEM, HOLLAND
Architect : H. TEEUWISSE



POST OFFICE, ROTTERDAM
Architect : G. C. BREMER

INSTALLATIONS



CHARTERED BANK OF INDIA, AUSTRALIA & CHINA, SHANGHAI
Architects : PALMER & TURNER

INSTALLATIONS



LLOYDS BANK LTD., ELY
Architect : H. MUNRO CAUTLEY



ROYAL LONDON MUTUAL INSURANCE
SOCIETY LTD., BRIGHTON
Architects : DENMAN & SON

INSTALLATIONS



THE ANGLO-SOUTH AMERICAN BANK LTD., BRADFORD
Architects : W. J. MORLEY & SON



THE EASTERN BANK LTD., CROSBY SQUARE, E.C.
Architects : ARTHUR BLOMFIELD & A. J. DRIVER

INSTALLATIONS



VICTORIA STATION HOUSE
Architects : TREHEARNE & NORMAN



UNION INSURANCE SOCIETY OF CANTON LTD., CORNHILL, E.C.
Architects : GUNTON & GUNTON

INSTALLATIONS



LYONS' CORNER HOUSE, COVENTRY STREET, W.
Architect: F. J. WILLS

INSTALLATIONS



MESSRS. PETER ROBINSON, OXFORD STREET, W.
Architects : T. P. & E. S. CLARKSON & H. AUSTEN HALL, Joint Architects



MESSRS. PETER ROBINSON, OXFORD STREET, W.
(VIEW FROM OXFORD CIRCUS)
Architects : T. P. & E. S. CLARKSON & H. AUSTEN HALL, Joint Architects

INSTALLATIONS



HENEKEYS, HIGH HOLBORN, W.C.
Architect : ERNEST R. BARROW



NEW AQUARIUM, ZOOLOGICAL GARDENS, N.W.
Architects : JOHN BELCHER, R.A., & J. J. JOASS

INSTALLATIONS



GIVAN'S IRISH LINEN STORES, NEW BOND STREET, W.
Architect : E. KEYNES PURCHASE



MESSRS. H. LAUDER & CO. LTD., KILMARNOCK
Architects : FREDK. SAGE & Co. Ltd.

INSTALLATIONS



MESSRS. R. C. ELLER LTD., VICTORIA STREET, S.W.
Architect: ERNEST G. VERITY



BRONZE SHOP FRONTS AT WEMBLEY EXHIBITION

INSTALLATIONS



28 WELLINGTON STREET, STRAND, W.C.
Architect : R. W. KNIGHTLEY GODDARD



SMALL SHOP FRONT, BRAINTREE

INSTALLATIONS

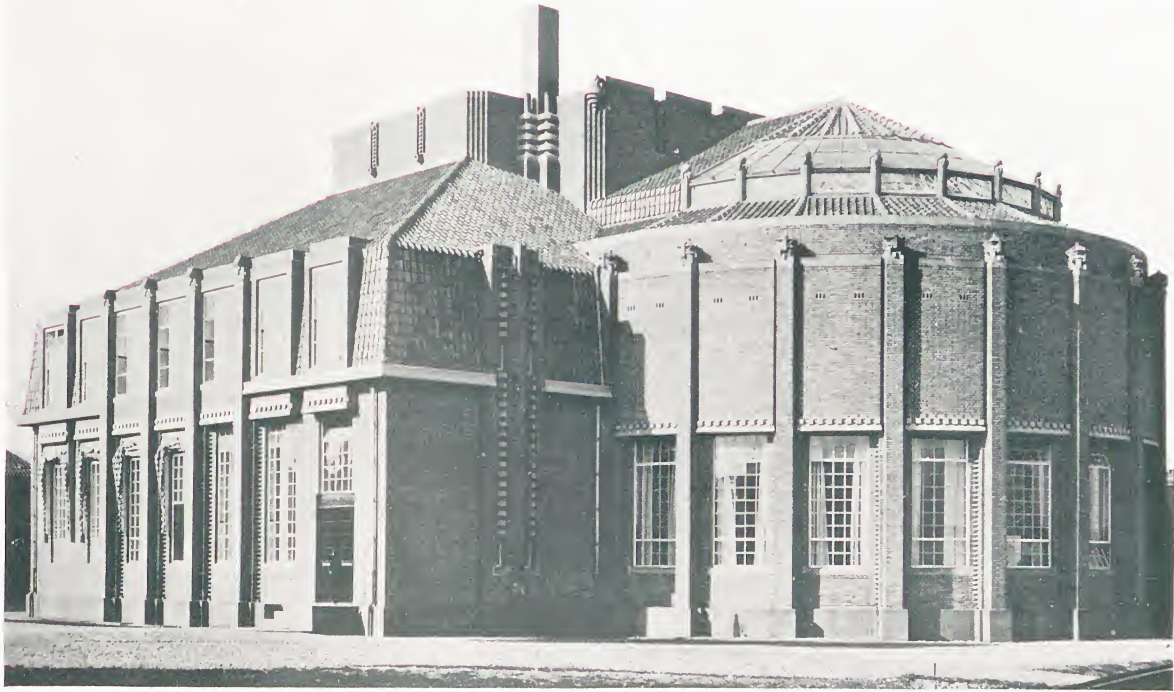


DEVENTER GLASS SHOP, THE HAGUE
Architects : POSTMA & HOOIGSTRATEN



MONEY ORDER OFFICE, THE HAGUE
Architect: G. C. BREMER

INSTALLATIONS

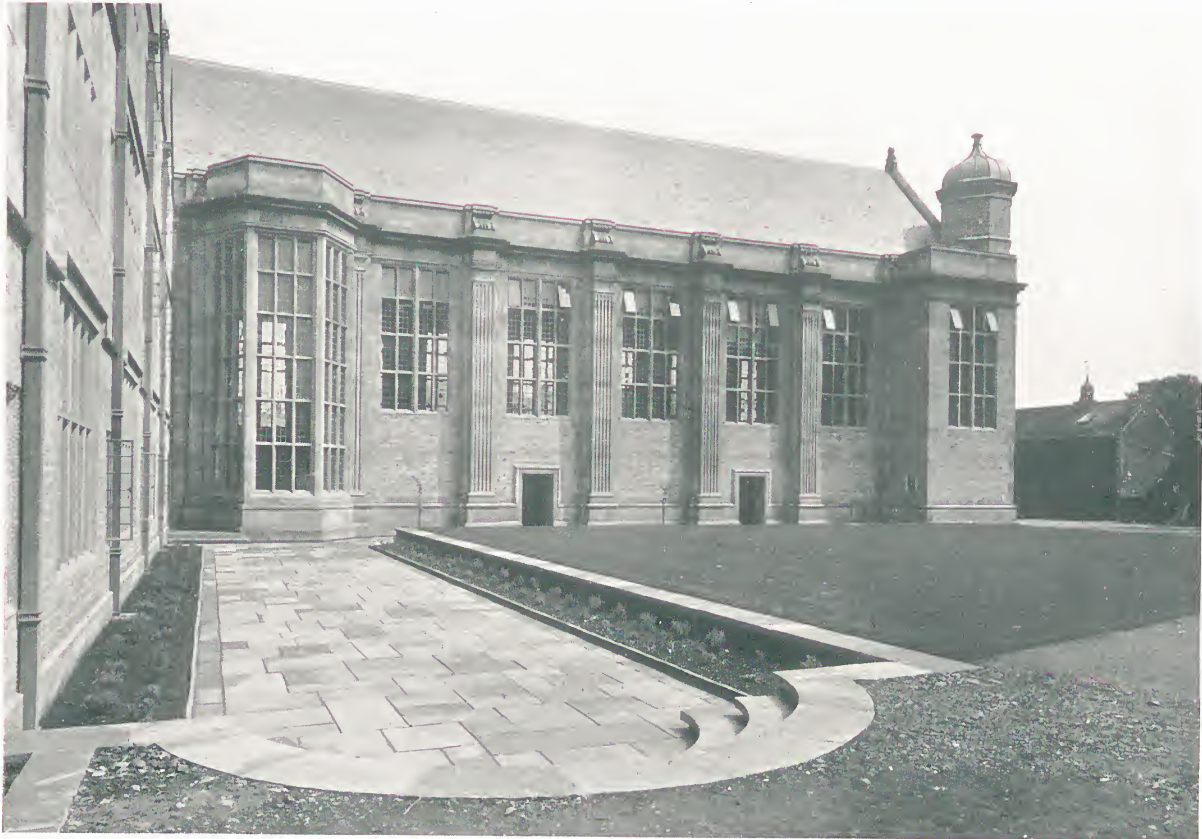


GOVERNMENT VETERINARY HOSPITAL, UTRECHT, HOLLAND
Architect : H. TEEUWISSE

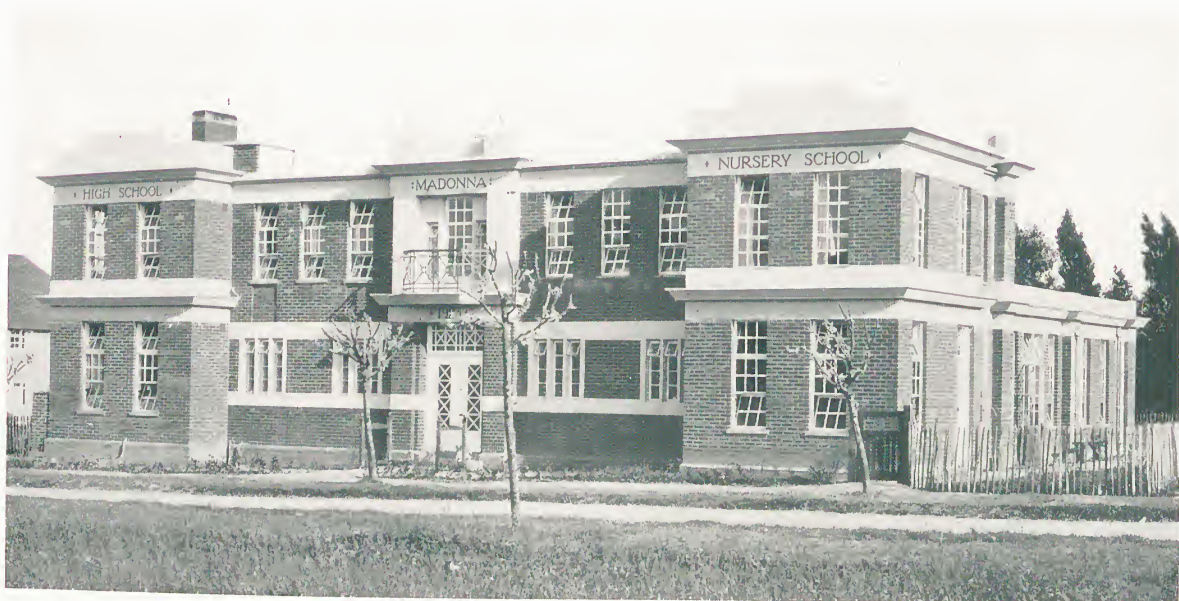


SHOP AT DORDRECHT
Architect : J. DUYNSTEE

INSTALLATIONS



WAR MEMORIAL HALL, UPPINGHAM
Architects : ERNEST NEWTON, R.A., & SONS



MADONNA SCHOOL, LETCHWORTH
Architect : CECIL H. HIGNETT

INSTALLATIONS



HOUSE AT MORETON, ESSEX
Architect : EDWARD MAUFE



HOUSE AT SANDY LODGE
Architect : ARTHUR A. KEEN

INSTALLATIONS

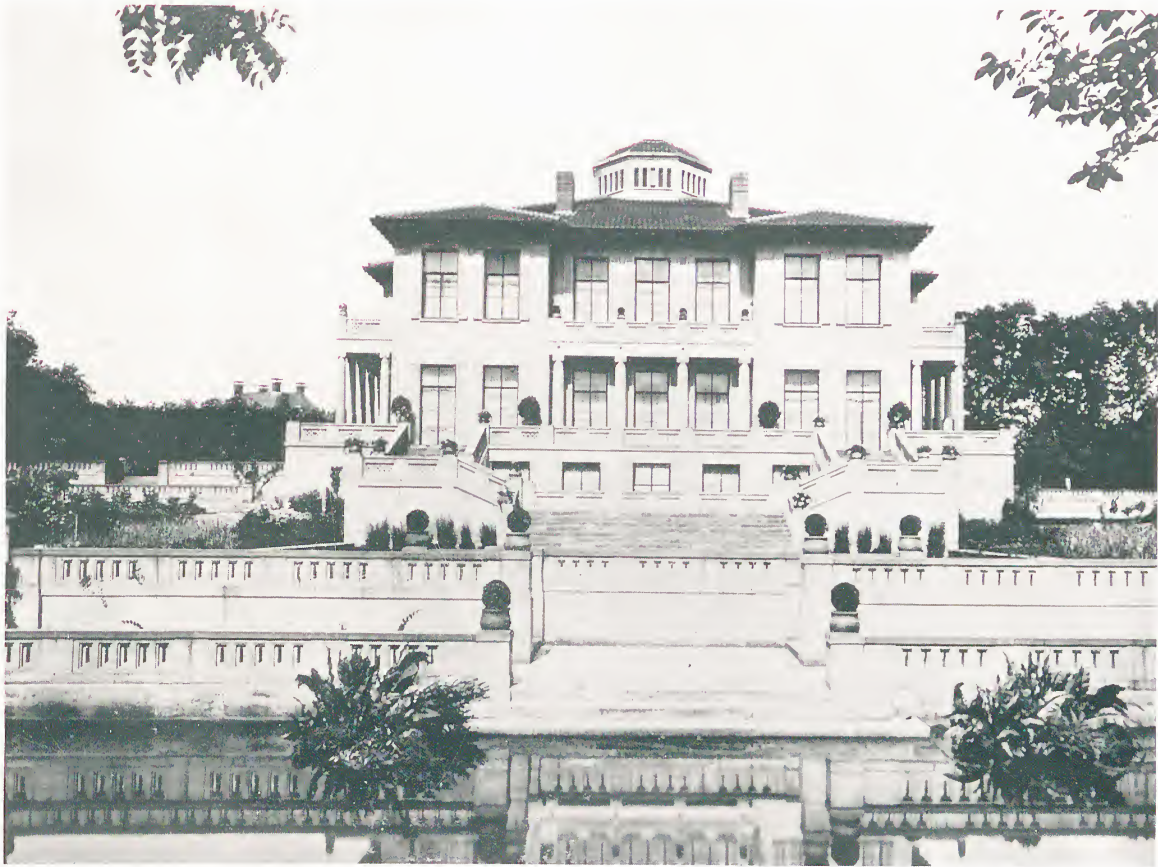


RUTLAND GRANGE, HULL
Architects : BLACKMORE, SYKES & CO.



HOUSE AT BEXHILL
Architect : GEO. HERBERT GRAY

INSTALLATIONS



PRIVATE RESIDENCE, THE HAGUE
Architect : J. LIMBURG



OLD CASTLE AT HELMOND, HOLLAND (Restoration)
Architect : J. W. HANRATH

TROPICAL STANDARD WINDOWS



IN introducing Metal Windows into tropical countries we have found that the size of window which was suitable in this country was not large enough for tropical climates, and we have therefore designed a range of tropical windows of larger dimensions constructed of heavier sections. These sizes are based upon the sizes of teak windows which are now in general use.

The chief advantages of metal as against wood for windows in tropical countries is that it is not subject to the ravages of white ant, and that it is not affected by extreme variations in climate and temperature.

SPECIFICATION

CONSTRUCTION. The frames are made of rolled steel sections, hydraulically straightened, the corners being oxy-acetylene welded (no electric welding is used). The Fenestra system is used for interlacing the steel glazing bars, which are $\frac{3}{4}" \times 1\frac{3}{8}"$, and are prepared to be glazed with wood beads supplied locally.

PROJECTING HINGES, to allow the windows to fold back against the face of the wall can be provided without extra charge, if required, but they must be specified.

FITTINGS. In malleable iron. (Gunmetal fittings are charged extra and must be specified.)

All necessary lugs sent loose for bolting on, either splayed or straight pattern, the type to be specified.

FINISH. All frames are sandblasted all over and dipped one coat of paint before and one after assembling.

NOTE.—Whilst the *Standard for Tropical Windows* is to *open inwards* and to *glaze from inside*, they can be made when specified to open outwards and glaze from outside or inside, or to open inwards and to glaze from outside.

FITTINGS

TYPE TA/U. Hinged at top and fitted with peg-stay.

TYPE TA/N. Hung at bottom on projecting lugs and fitted with spring catch for long arm, and drop down side arms.

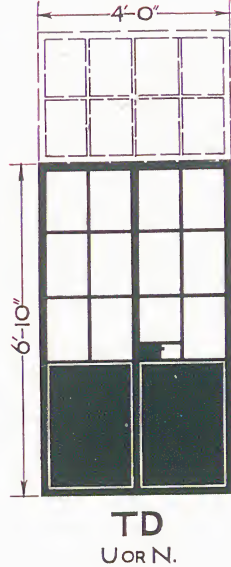
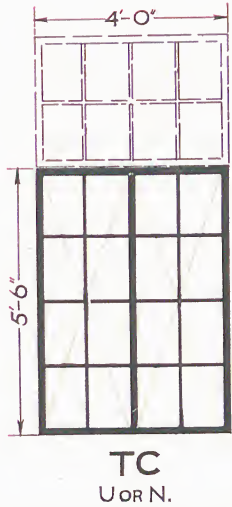
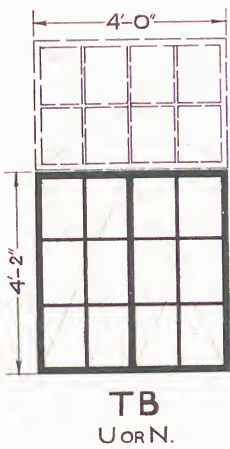
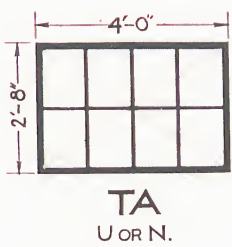
TYPES TB/U or N, and TC/U or N. Folding Casements opening outwards (U), or inward (N), fitted with espagnolette bolt, with striking plates on opening, and fixed frames, each leaf opening out fitted with stays. Each leaf opening in fitted with

cabin hook eyes rivetted to each leaf, and cabin hooks sent loose.

TYPE TD/U or N. Folding Doors opening outwards (U), or inwards (N), fitted with mortice lock and lever handles on last closing leaf, and barrel bolts at top and bottom on first closing leaf. Eyes for cabin hook rivetted to each leaf, and cabin hooks sent loose. Panels of 16 BWG welded or rivetted to frame.

NOTE.—If bolts are required on both leaves they must be specially called for.

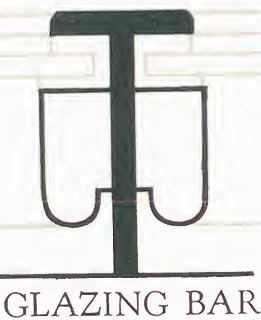
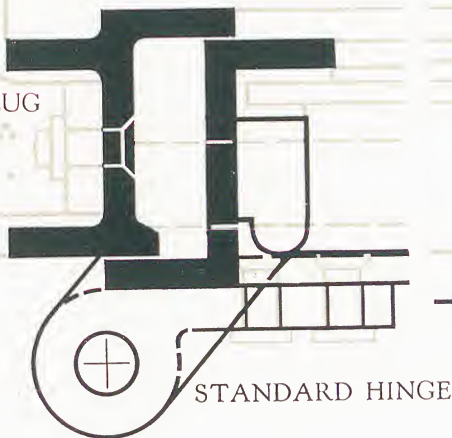
TROPICAL STANDARDS



SIZES

OUTSIDE

SPLAYED LUG



NOTE

Types T.B., T.C. & T.D., do not include the Transome Light, T.A., which must be specially called for when required. Thus: T.B.A., T.C.A. & T.D.A.

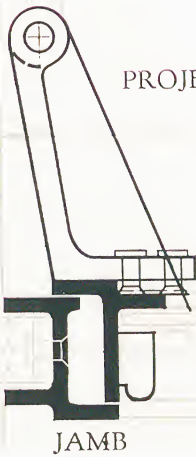
All types can be made to open inwards (N) or outwards (U). The standard is inwards. Unless otherwise specified all doors and windows will be made to glaze inside, prepared for wood beads. When glazed from outside metal glazing clips are supplied.

FULL SIZE SECTION THROUGH JAMB



ALTERNATIVE DETAIL HALF FULL SIZE

Showing Projecting Hinge to allow Casement to open against outside face of wall. This must be specified if required.



PROJECTING HINGE

SIZES



MEETING RAIL

WEATHER BAR

TRANSOME

OUTSIDE

CILL

SIZES

FLYSCREENS & SHUTTERS



IN TROPICAL COUNTRIES practically all doors and windows are provided with flyscreens or shutters, or both. Hitherto these have been made in wood or attached to the same wood frame as the window.

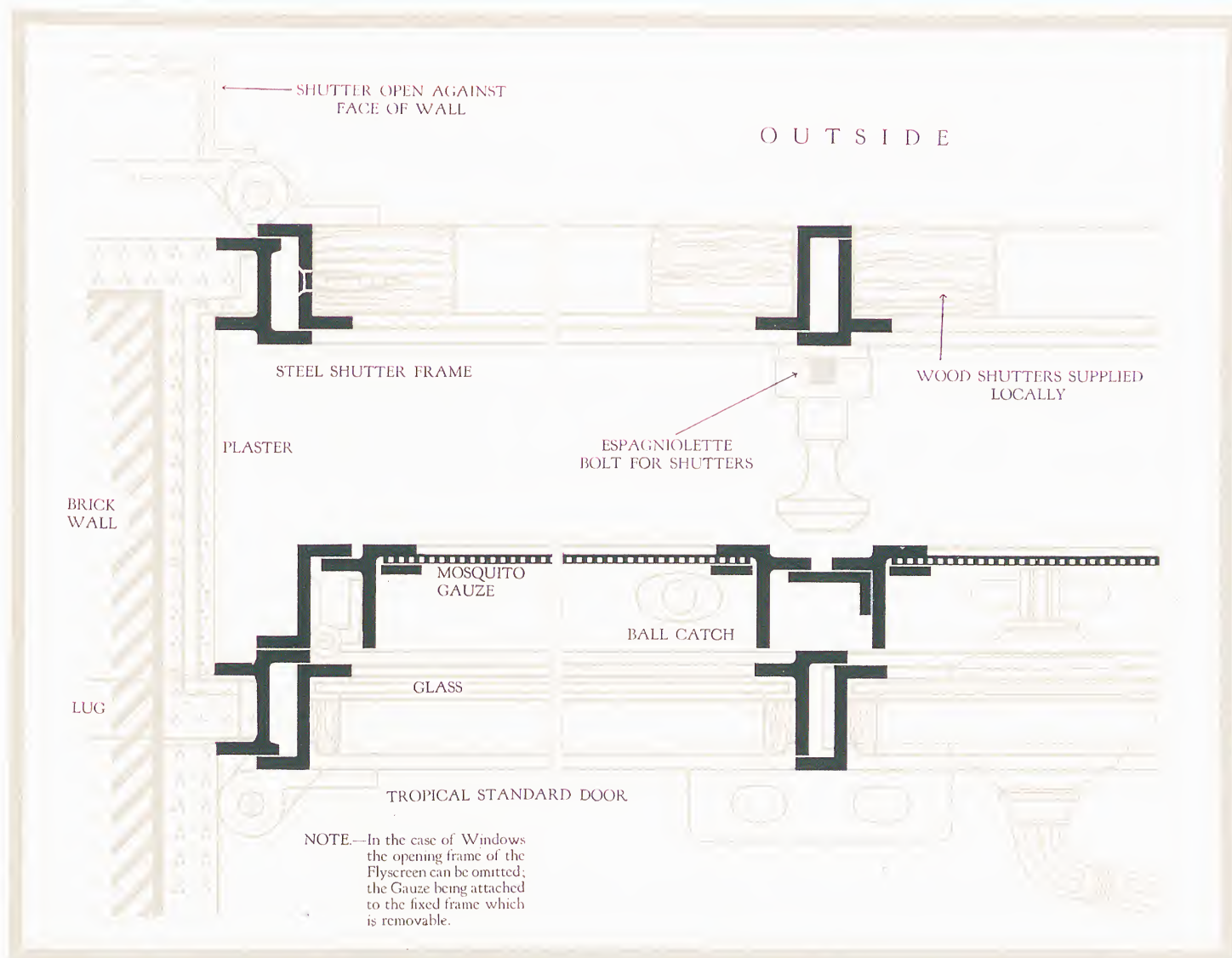
FLYSCREENS

REMOVABLE, FOR WINDOWS. A Zed frame is attached to the outside of the casement by means of clips so that it can be easily removed when required.

OPENING, FOR DOORS. A Zed frame is permanently rivetted to the outside of the casements, and supplementary hinged frames are attached to this. These frames are kept shut by means of Ball catches top and bottom, so that they can be easily opened or closed from either outside or inside.

The gauze used is 16 mesh galvanized wire attached to the surrounding frame by brass screws. Copper gauze can be used alternatively at a slight extra.

FLYSCREENS & SHUTTERS



SHUTTERS

SHUTTERS are generally used in tropical countries as a sun protection, and for such purposes steel is not so suitable as wood owing to the radiation of the metal slats. Further, the best form of slat is not so easily produced in metal as in wood. At the same time there is every reason why the outer frame containing the slats should be in metal, as it is thus permanent, and can be more readily attached to metal windows.

It will be seen in the detail shown that the locally-made wooden shutters are fixed into a standard Tropical Window construction similar to the glazed portion, but with only a single horizontal glazing bar. Espagniolette bolts are provided to secure the shutter from inside. Turnbuckles are provided for fastening the shutter against the face of the wall when open.

The shutter is coupled to the window by steel straps.

In specifying flyscreens or shutters for inward opening Tropical Standard Windows, the window type should be given, and, if possible, a detail of the surrounding masonry and framework.

HOSPITAL WINDOWS



Ventilation without draught and ease of cleaning, are first considerations in the fenestration of any hospital.

Upper Ventilator
Horizontally Pivoted

Peg Stay, Spring Catch,
or Gearing, can be
fitted

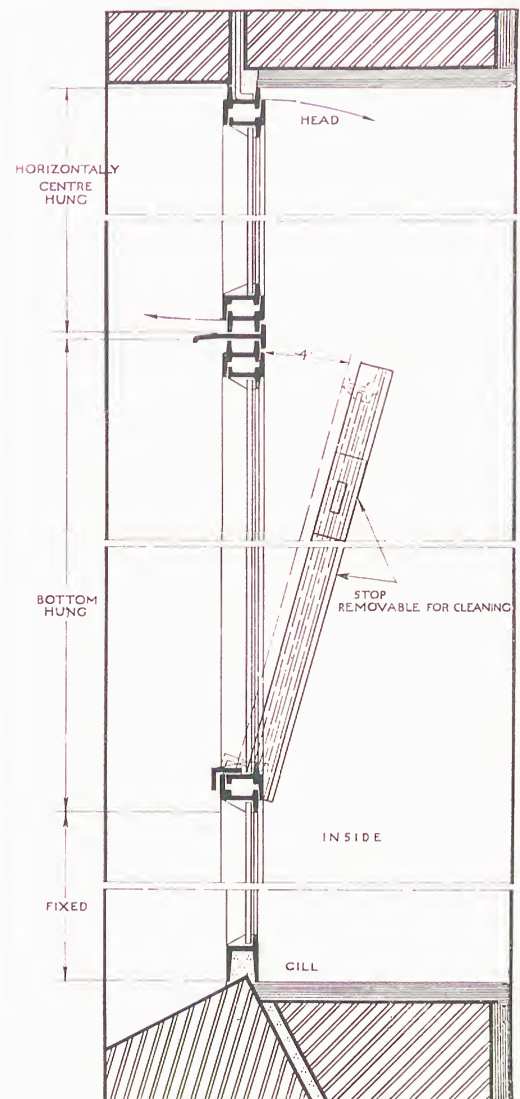
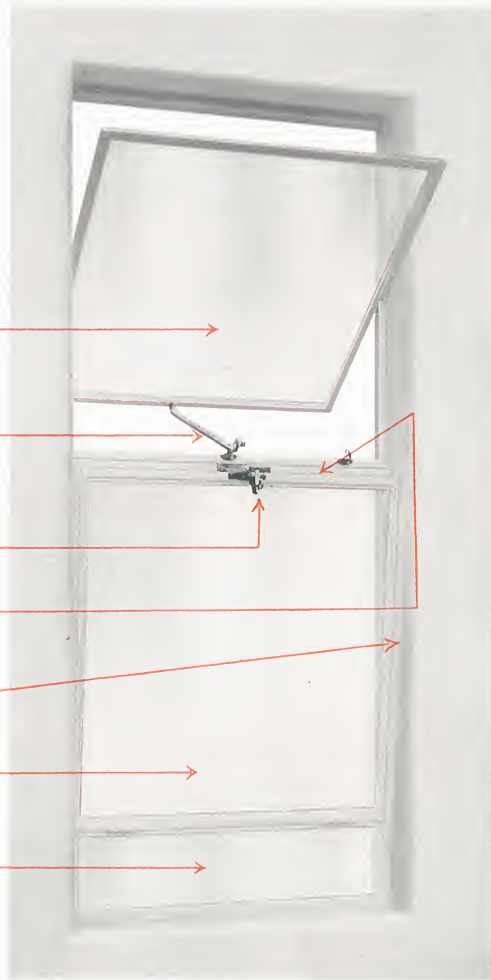
Spring Catch

Air space about 4"

Removable Stops

Lower Ventilator
bottom hung

Fixed Portion



THE lower ventilator is hung at the bottom and provided with stops, fixed to the jambs, which allow the ventilator to fall back, giving a protected air passage of about 4" half way up the window. These stops are easily taken off to allow this part of the window to be cleaned.

Alternatively glazed side cheeks can be provided instead of the stops when the window is fixed near the inside face of the wall.

To protect the lower ventilator from rain splash and consequent dirt accumulation, a fixed pane about 9" deep is provided below it. This is optional.

The upper ventilator is horizontally pivoted, and can be operated alternatively with a peg stay, spring catch, or screw gear.

HOSPITAL WINDOWS



IN this type of Window it is possible to operate each leaf separately, and to clean the outside of the glass from the inside.

Windows of this type should be glazed from *outside*. Radius corners can be supplied if required.



OPERATING ROOM WINDOWS

HOSPITAL OR SCHOOL WINDOWS



THIS ILLUSTRATION shows a special type of window designed for use in Hospitals and Schools.

It consists of a pair of Folding Casements, opening outwards to provide a maximum amount of ventilation when required. Above this is a top-hung ventilator operated with Duplex Gear, thus avoiding the use of long arms and cords hanging down the centre of the window. At the lower part is a bottom-hung ventilator provided with side cheeks to give ventilation without draught. Alternatively the lower part can be made fixed.

Made in two sizes :

7' 3" × 4' 0"

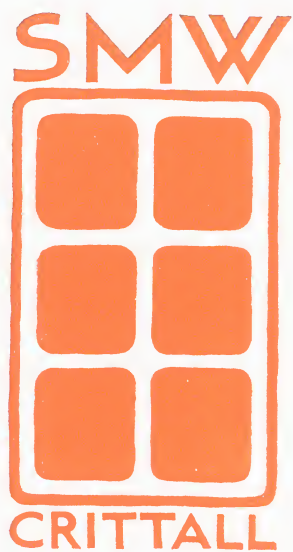
7' 3" × 3' 0"



Its chief advantages as compared with wooden windows are :

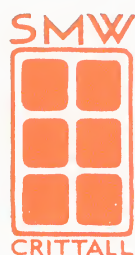
1. It can be cleaned from the inside of the building.
2. There is a minimum of obstruction to light.
3. The ventilation can be adjusted from zero to 100%, and adequate ventilation can be had without draught.

STANDARD METAL WINDOWS



Windows from Stock
All the qualities of the Best Metal Casement
To replace the unsatisfactory Wooden Windows
At Less Cost

THE NEW STANDARD



IN THE FIVE YEARS that we have been making Standard Metal Windows we have delivered over 2,000,000 of them, an ample proof of their worth and superiority over the wooden window.

We feel that we should be very much to blame had we not profited by the experience which we have gained, and turned to account the criticisms and complaints which must inevitably be made in the development and perfection of any article of commerce, and we now have pleasure in announcing the New Standard Metal Window, which embodies the following improvements:—

1. **THE HANDLE PLATES AND STAY BRACKETS** are rivetted instead of welded.
It has been found that broken welds have occurred through rough handling, and these breakages are extremely difficult to replace once the window is fixed.
2. **ALL FITTINGS ARE POWER RIVETTED.**
It has been found that brackets occasionally work loose through the uncertainty of hand rivetting. By mechanically rivetting, this is avoided, each rivet being uniformly headed.
3. **MORE SUBSTANTIAL FITTINGS.**
The old handle has been criticised as 'mean,' and the stay has been found to bend. These

fittings are now replaced with fittings of a more substantial pattern, similar to those fitted to our Universal Casements.

4. **A LARGER STRIKING PLATE** made of extruded gunmetal replaces the small brass wire striking plate previously fitted. The use of a striking plate is necessary to prevent the nose of the handle coming in contact with the metal frame, and thereby destroying the paint. A stop has also been provided on the handle plate.
5. **NEW PATTERN CURTAIN ROD BRACKETS.**
The pattern which has previously been supplied allowed the curtain to come too close to the glass, and caused it to absorb some of the surface condensation common to all new buildings. The present one will overcome this trouble.
6. **IMPROVED HINGES TO TOP-HUNG VENTILATORS.**
The new pattern which is extremely neat in appearance allows the casement to be opened to any degree without fouling.
7. **STIFFER OPENING FRAMES.**
A Stiffer Opening Frame, nearly 33 $\frac{1}{3}$ % heavier than the present one is now provided for all ventilators, to meet the criticism that the window was whippy.

SPECIFICATION

CONSTRUCTION. The frames are made of rolled steel bars, the corners being oxy-acetylene welded (no electric welding is used). The opening frame is of a specially heavy section. The Fenestra system is used for interlacing the Steel Glazing Bars, which are prepared to glaze from outside.

OPENING LIGHTS. All Opening Lights are hinged at side or top to open outwards. The hinges are of solid rolled steel sections rivetted to the frame. The pins are of phosphor bronze.

For Inward Opening types of the same size (*see special list*).

CLEANING HINGES. Projecting Hinges, giving a space of about 4 $\frac{1}{2}$ " between the fixed and opening frames when open, to permit cleaning from inside, are provided when called for, without extra charge.

FITTINGS. Pressed Steel Handle Plate with stop and Stay Bracket are rivetted to the face of the opening frame, the fixed frame being pressed out to clear them.

Handle with night ventilating notch engaging with drawn gunmetal striking plate.

Peg Stay of channel section engaging with tapered Peg rivetted to the frame.

Non-projecting Stays can be provided if desired.

Night Ventilators (F Type) hung on extruded gunmetal hinge and fitted with drop down stay.

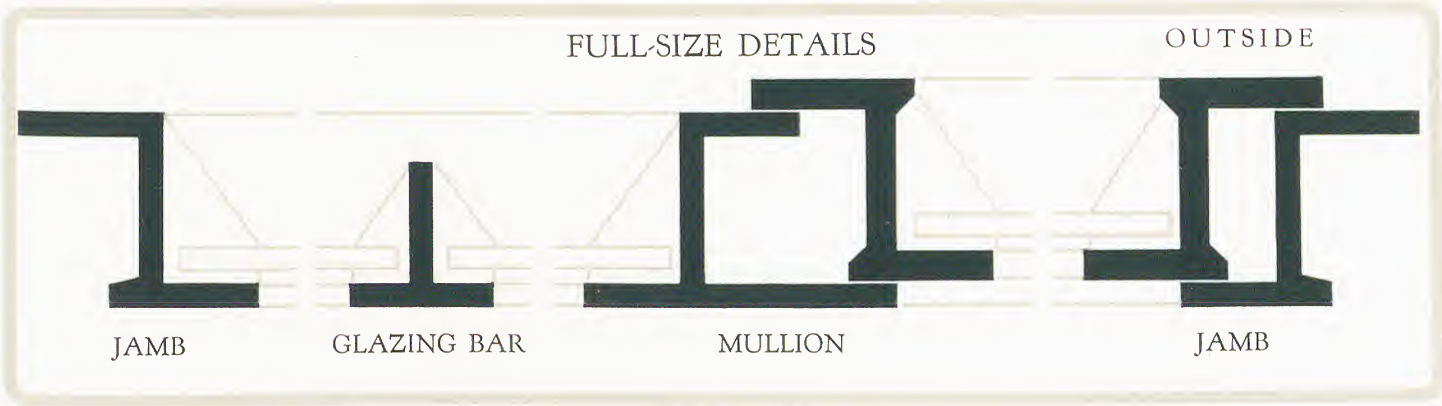
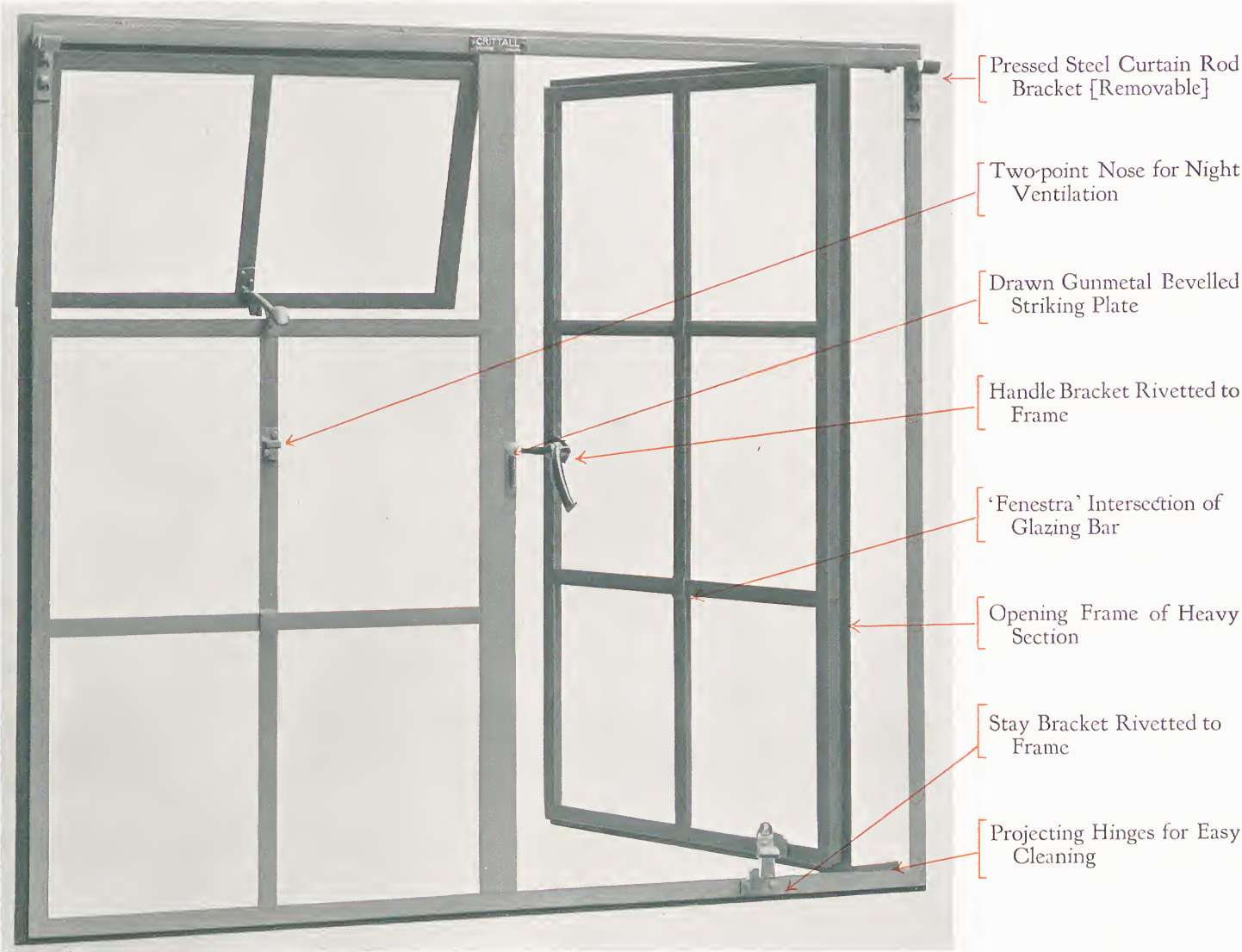
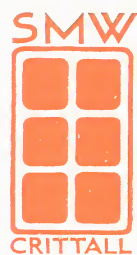
Detachable curtain rod brackets of rolled section.

All necessary fixing screws and lugs provided.

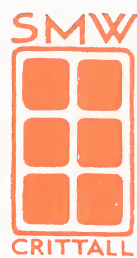
FINISH. Sandblasted all over and dipped one coat of paint before assembly and one after.

METAL WINDOW

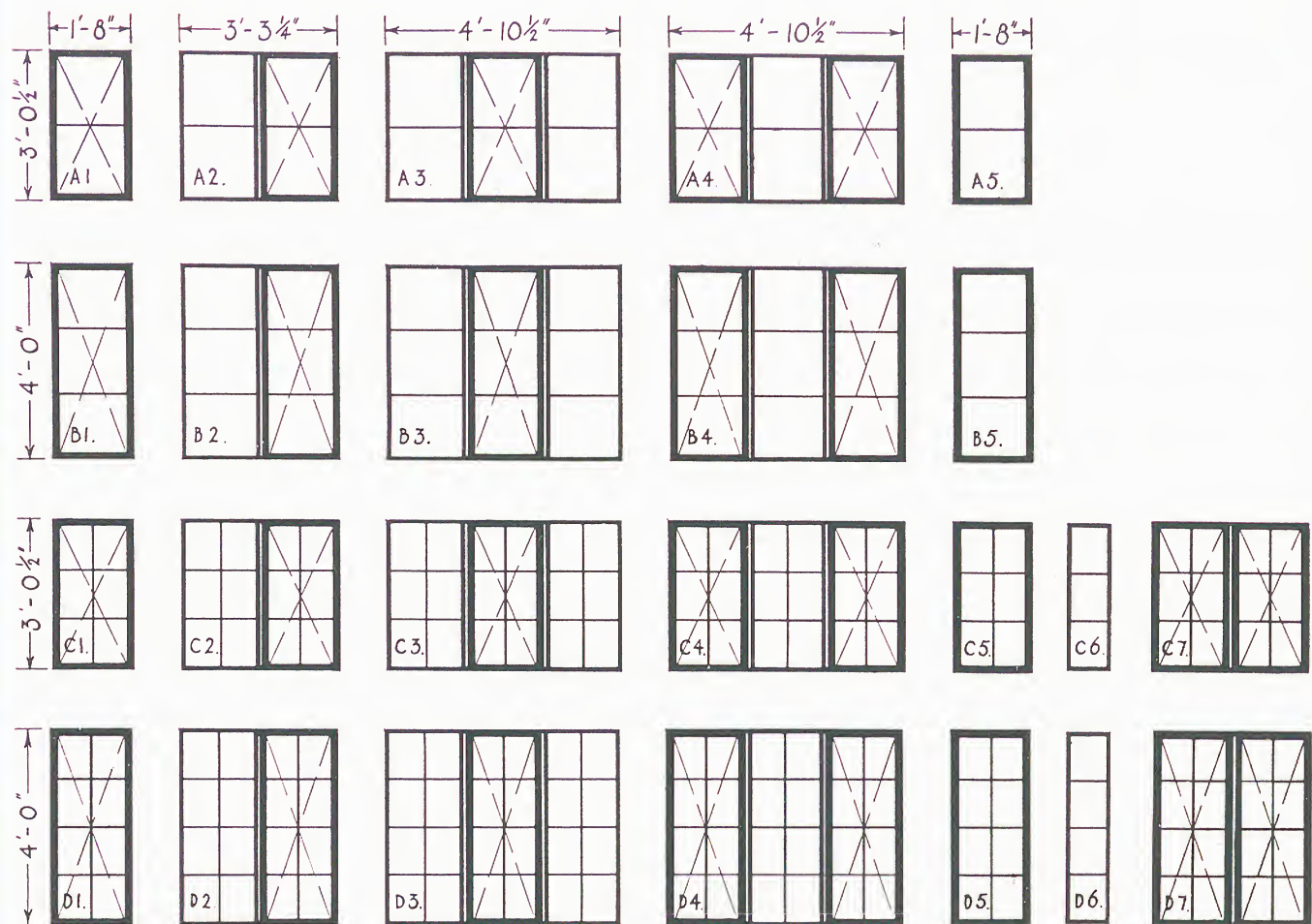
INTERIOR VIEW OF THE NEW STANDARD METAL WINDOW OUTWARD OPENING TYPE [C₂F]



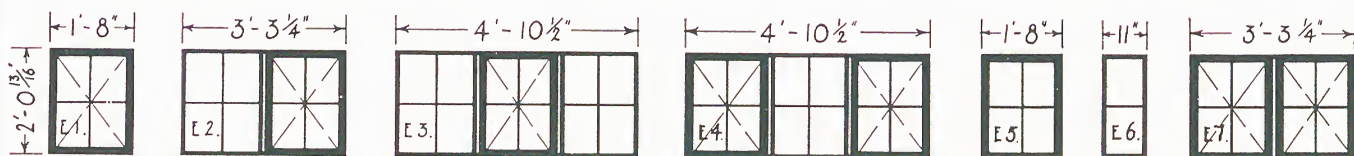
STANDARD STOCK SIZES



OUTWARD OPENING TYPES

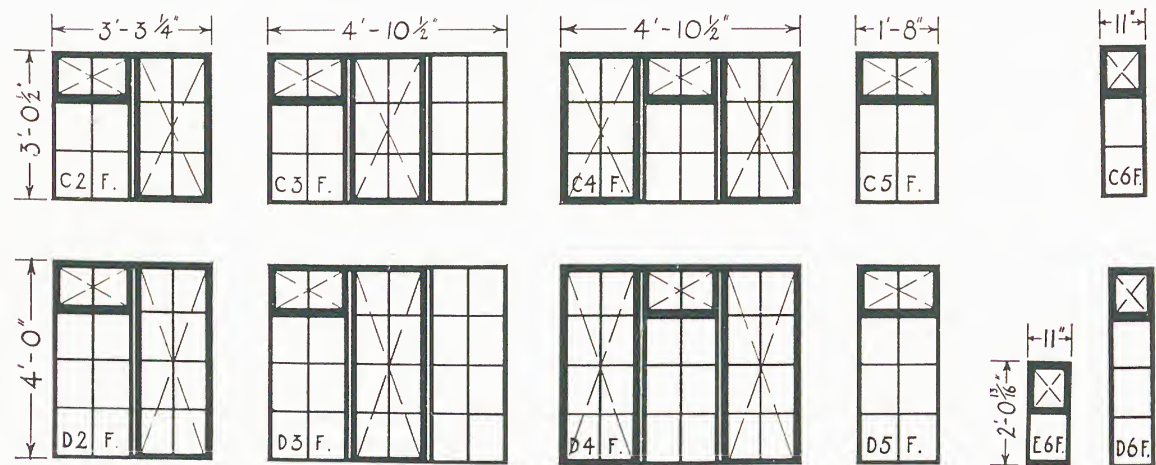


SIDE-HUNG TYPES



THESE TYPES ARE MADE EITHER SIDE-HUNG (E.S.) OR TOP-HUNG (E.).

SIDE-HUNG & TOP-HUNG

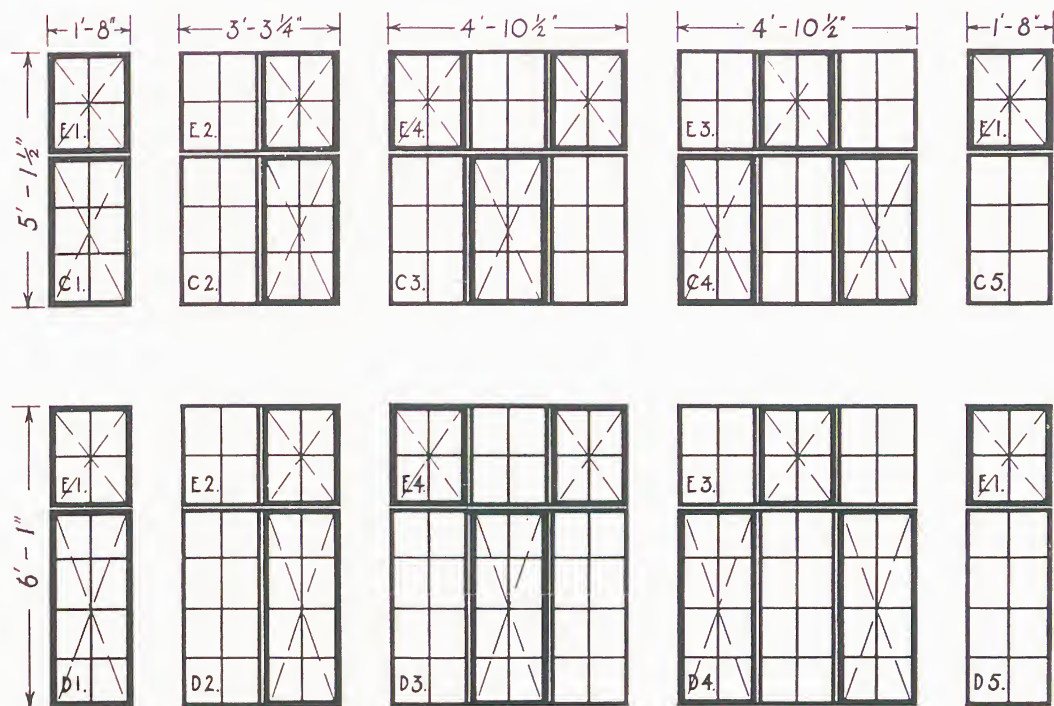


SIDE-HUNG TYPES WITH NIGHT VENTILATORS

STANDARD STOCK SIZES



OUTWARD OPENING TYPES



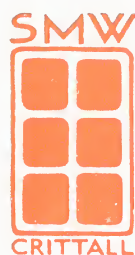
COMPOSITE TYPES

NOTE.—Where maximum ventilation is required C 7, D 7 & E 7 can be substituted for C 2, D 2 & E 2

DETAILS REQUIRED WHEN ORDERING STANDARD METAL WINDOWS

1. Type. Please quote both letter and number.
2. Quantity.
3. If fixed in wood frames or direct to masonry.
4. Hand. [The hand of a casement is the side on which the hinges are fixed looking from inside.]
5. If projecting hinges are required to side-hung portions.

THE NEW STANDARD



SPECIFICATION FOR INWARD OPENING TYPES OF STANDARD METAL WINDOWS

CONSTRUCTION: The frames are made of rolled steel sections hydraulically straightened. All corners are oxy-acetylene welded (no electric welding is used). The Fenestra system is used for interlacing the T glazing bars, which are prepared for glazing from outside.

OPENING LIGHTS: Side-hung on rolled steel pivots with Gunmetal Pins, or Bottom-hung on extended lugs.

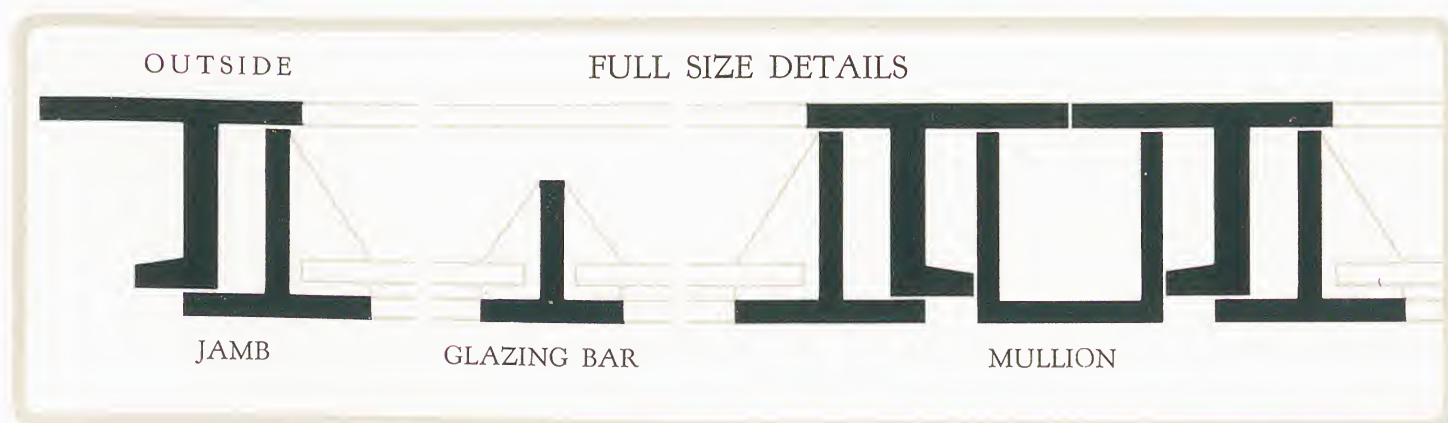
FITTINGS: Folding Casements have espagnolette bolts and steel rods.

Side-hung Casements are provided with handle and eye for cabin hook.

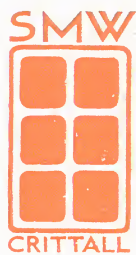
Bottom-hung Casements, types L1 and L7, have spring catch and folding side arms.

All necessary fixing screws and lugs are provided.

FINISH. Sandblasted all over and dipped one coat of paint before assembling and one after.



METAL WINDOW



INTERIOR VIEW
OF THE
NEW STANDARD
METAL WINDOW
INWARD OPEN-
ING TYPE



Steel Pivots with Gunmetal Centre Rivetted to Frame

Pressed Steel Bolt Striking Plate

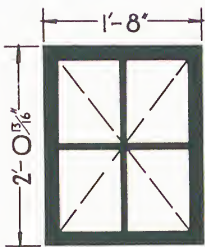
Fenestra Intersection of Glazing Bar

Gunmetal Espagnolette Box, with Steel Rods, Screwed to Frame

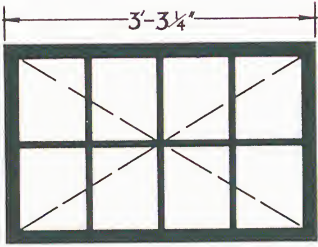
Pressed Steel Espagnolette Bolt Guide

Eye for Cabin Hook Rivetted to Frame

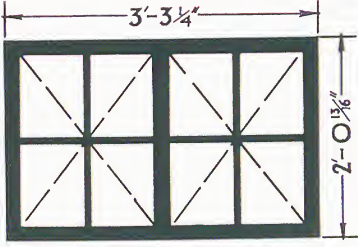
All corners Oxy-Acetylene Welded



L 1. & LS 1.



L 7.

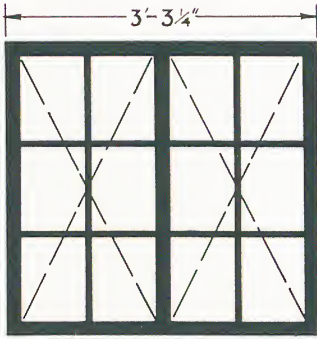


LS 7.

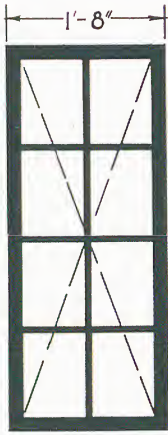
L = Bottom Hung. LS = Side Hung.



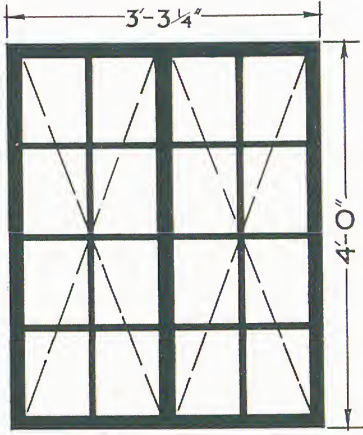
J 1.



J 7.



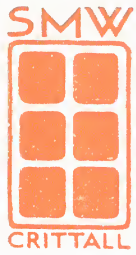
K 1.



K 7.

SIDE-HUNG TYPES

LEAD GLAZING



For STANDARD METAL WINDOWS



THE increasing amount of better class domestic building, coupled with the popularity of the Standard Metal Window, has lead us to standardize Lead Glazing. By confining ourselves to a range of standard sizes, we are able to produce this at an extremely low figure.

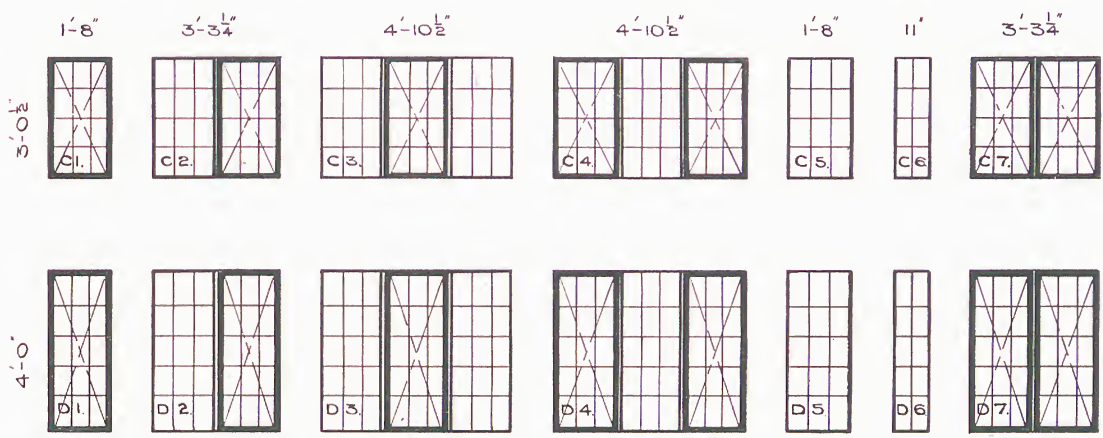
All sizes are kept in stock and immediate delivery can be relied upon. No leaded light is despatched that has not been in stock at least three weeks. This ensures that the cement in which the glass is bedded is properly set.

Crittall Standard Leaded Glass is of the highest quality and we are prepared to enter into any reasonable guarantee as to its efficiency.

SPECIFICATION



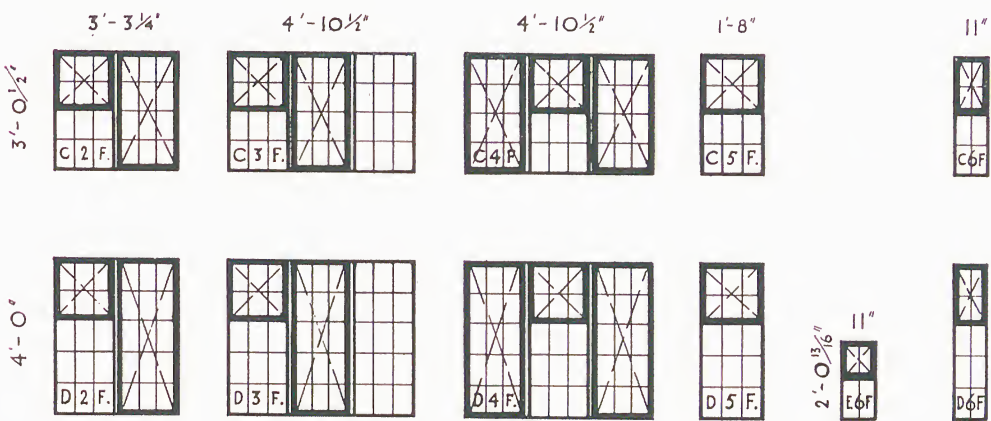
For CRITTALL STANDARD LEAD GLAZING



SIDE HUNG TYPES.



THESE TYPES ARE MADE EITHER SIDE HUNG (ES) OR TOP HUNG (E).



SIDE HUNG TYPES WITH NIGHT VENTILATORS.

LEAD GLAZING of sheet glass in squares approximately 8" x 6" with 1/2" flat beaded comes, reinforced with steel cores where required. No saddle bars are necessary.

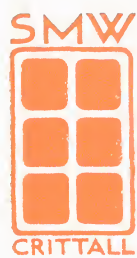
Included in the range of standard sizes are three single panels to fix direct to wood frames. Size 4' 0" x 1' 8" (XD); Size 3' 0 1/2" x 1' 8" (XC); Size 2' 0 13/16" x 1' 8" (XE).

They are for use in mullioned openings in conjunction with types C1, D1, and E1.

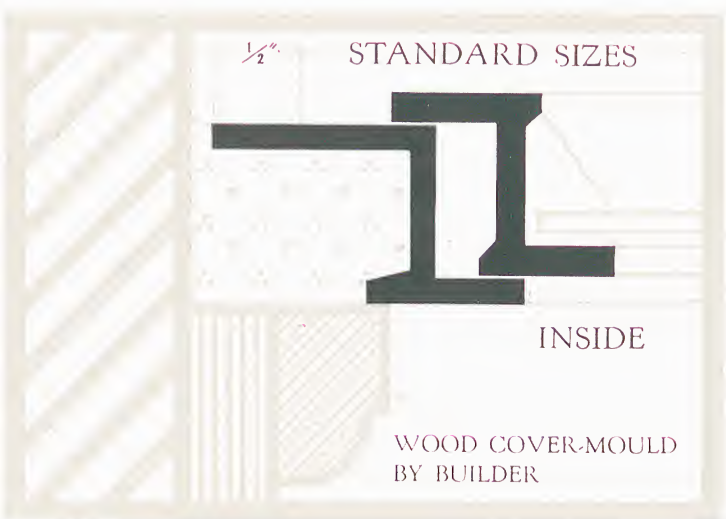
All other lead glazed panels are known by the type number of the Standard Metal Windows into which they are fixed; that is to say, in specifying lead glazing it is only necessary to mention the type number of the window for which the glazing is required.

Special sizes, designs and quality of glass can be substituted, but any deviation from the standard specification considerably increases the cost and causes delay.

EXTRA WIDE FRAMES

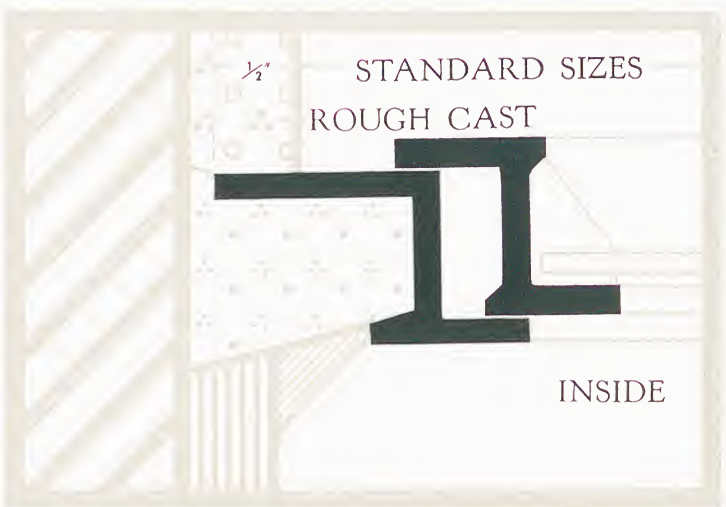


AN alternative frame section is used in cases where a rather heavier appearance is required than is provided by the standard sections. This provides a total width of frame of approximately 2" and increases the standard dimensions by 1" in height and width.



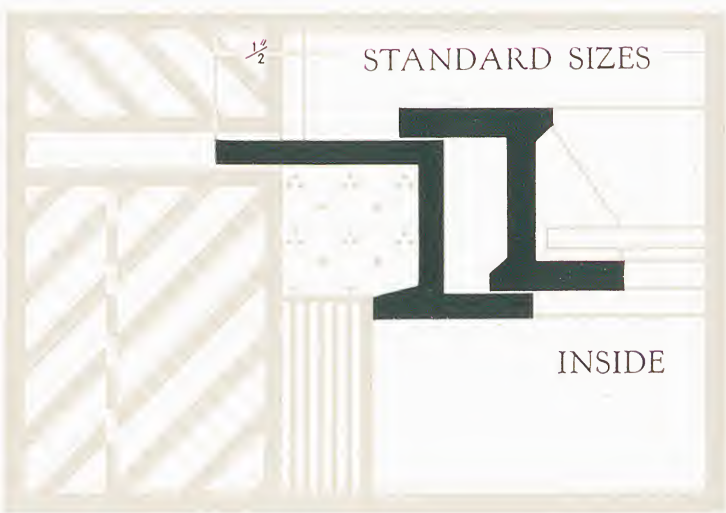
DETAIL No. 11

THE extended outer flange can be used as an extra weather check against the masonry in exposed positions, as shown in details 11A and 11B. The short inner leg allows the channel to be properly filled with cement, which can be finished with a wood cover mould if desired.



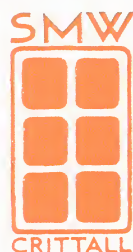
DETAIL No. 11A

ALTERNATIVELY, the long flange can be built into the jambs or set behind a reveal formed in the masonry.



DETAIL No. 11B

C L E A N I N G

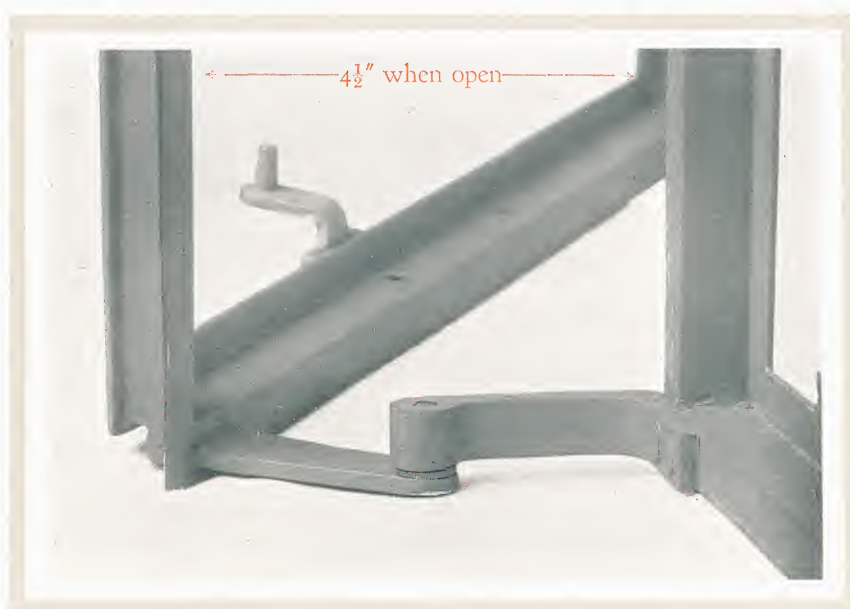


THE COST OF CLEANING upper storey windows when the casements open outwards amounts to a considerable item annually where this cannot be done from inside by the tenant.

This expense can be saved by the use of projecting hinges, which will be supplied

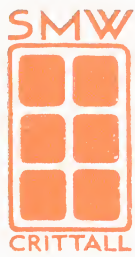
without extra charge when called for. There are no working parts to get out of repair, or become clogged by subsequent coats of paint, and the housewife can clean all windows without danger or difficulty.

Where projecting hinges are required they must be specially called for.



WINDOW OPEN

CAVITY WALLS



DETAIL No. 4

WHERE good facing bricks are obtainable, walls are usually constructed with a 2-in. cavity, the metal frame being fixed in the middle of the outer wall. In order to obtain the best results with this method of construction, care should be taken to see that there is as little contact as possible between the inner and outer wall, as otherwise the inner wall, which is dry, will absorb the moisture from the outer wall. The method shown on the opposite page of closing the cavity has been found to be quite successful in this respect.

Fixing Instructions

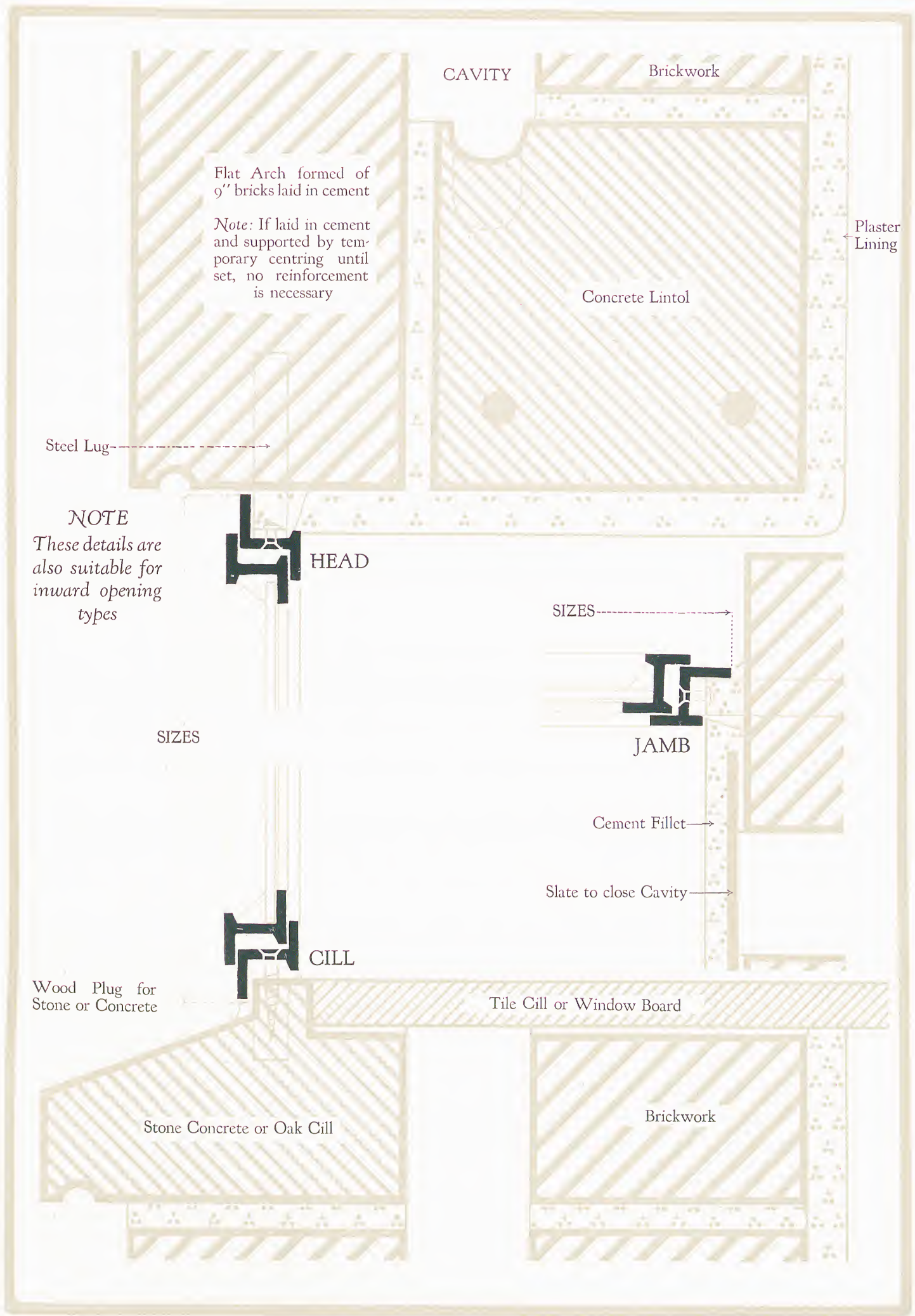
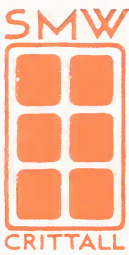
‘ BUILD THEM IN ’

1. Attach lugs and stand frame upon cill. Adjust carefully, to see that the frame opens and closes properly.
2. When accurately adjusted, shut and wire the ventilators, and strut the frame securely, so that it cannot be moved.
3. As the brickwork proceeds, see that the channel of the metal frame is well filled with cement to make a good joint.
4. No weight must be allowed to rest on the metal frame when placing the lintol or brick arch.
5. When the opening is complete, the external joint should be raked out and pointed with mastic. The slate damp-course closing the cavity should be applied immediately before the plaster, and should be set in cement.

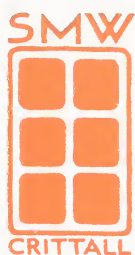


HOUSE AT TUNBRIDGE WELLS
Architect : CECIL BURNS

FIXING DETAIL No. 4



ROUGH-CASTING



DETAIL No. 5

As an alternative to brick-faced buildings, pebble dashing or other forms of external rendering are often adopted. The details on the opposite page show the correct method of installing Standard Metal Windows in such buildings.

Particular attention is drawn to where the sizes are given. An allowance of about 1 in. all round must be made for the external finish of the plaster.

An alternative to returning pebble dashing (i.e. rough-casting) into the reveal is to finish the reveal in neat cement. This makes a sound weatherproof finish, and the cement can be painted the same colour as the metal frame, to give the effect of a wide outside frame, the absence of which is sometimes used as an argument against using metal windows.

With this method of installation there is not the same advantage in building

frames in, as when they come in direct contact with the surrounding brickwork (see detail No. 4). They may be built in if desired, but care must be taken to see that they are not put out of alignment before the final cement fillet is applied.

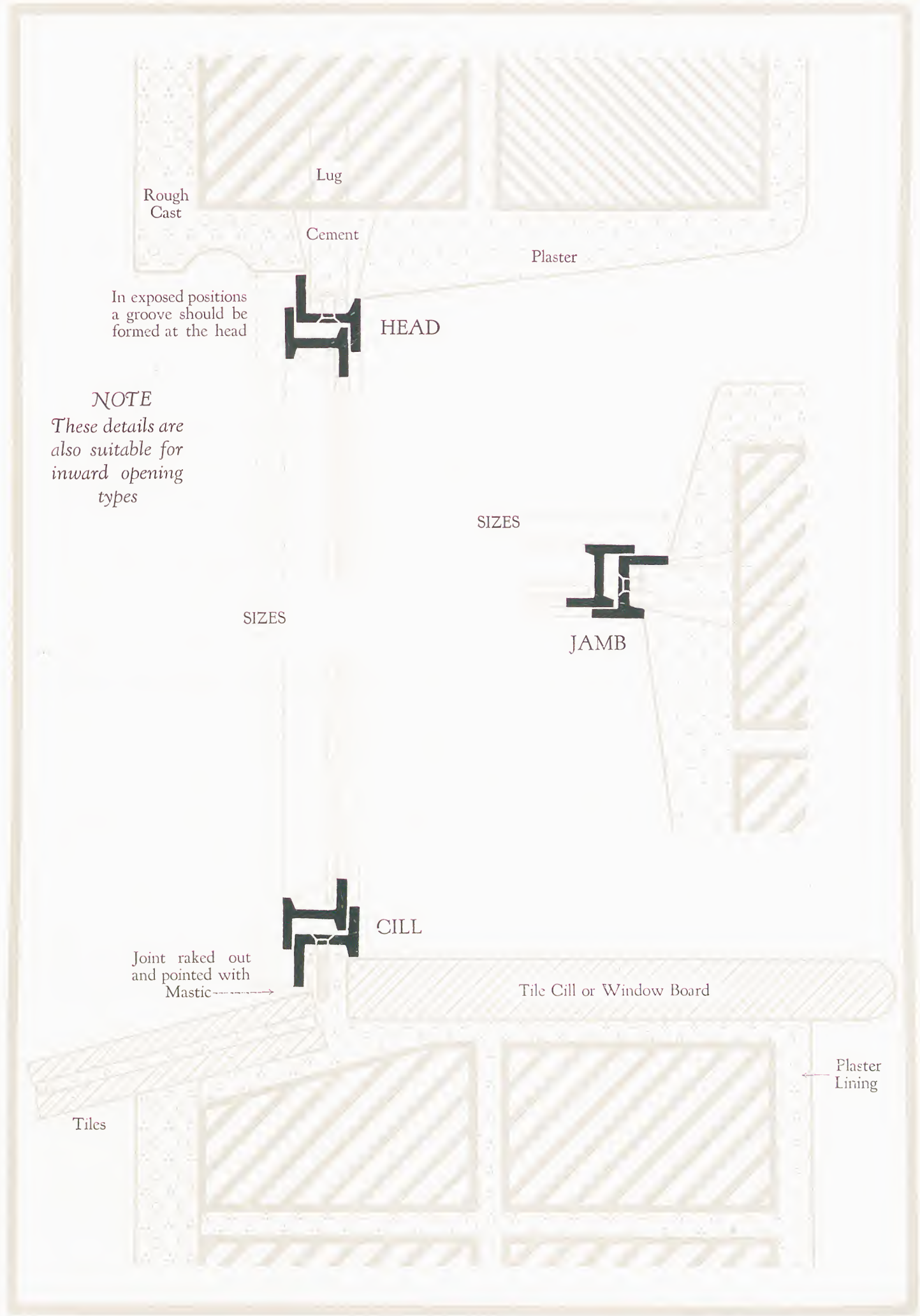
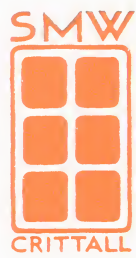
FIXING INSTRUCTIONS

1. Attach lugs to the frame and knock out bricks which come opposite to them, so that the lugs are free from the masonry.
2. Stand the window upon wooden blocks and carefully adjust with wedges, and see ventilators open and close correctly.
3. When adjusted, fix the lugs in cement, and, when well set, remove the blocks. Fill in the space between the masonry and the frame with cement, being careful to see it is well tamped into the channel of the metal frame.
4. When external tile cills are used, the tiles should first be laid, and when set, grout should be poured through the fixing holes, and fixing screws placed in them.
5. When the cement is well set, the external and internal plaster can be applied.

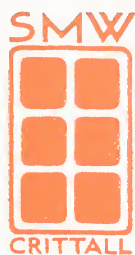


THE BEAR INN, OXSHOTT
Architect : JOSEPH HILL

FIXING DETAIL No. 5



FRAMED OPENINGS



DETAIL No. 6

WHEN framed openings are used in wood, stone, or artificial stone, they should be prepared with a $\frac{3}{8}$ -in. external rebate all round, as shown on the opposite page.

We do not advise fixing Standard Metal Windows in wooden frames, owing to the poor quality of timber now available. Wooden frames will most probably shrink, crack, or twist, and such subsequent defects will react on the satisfactory working of the metal window.

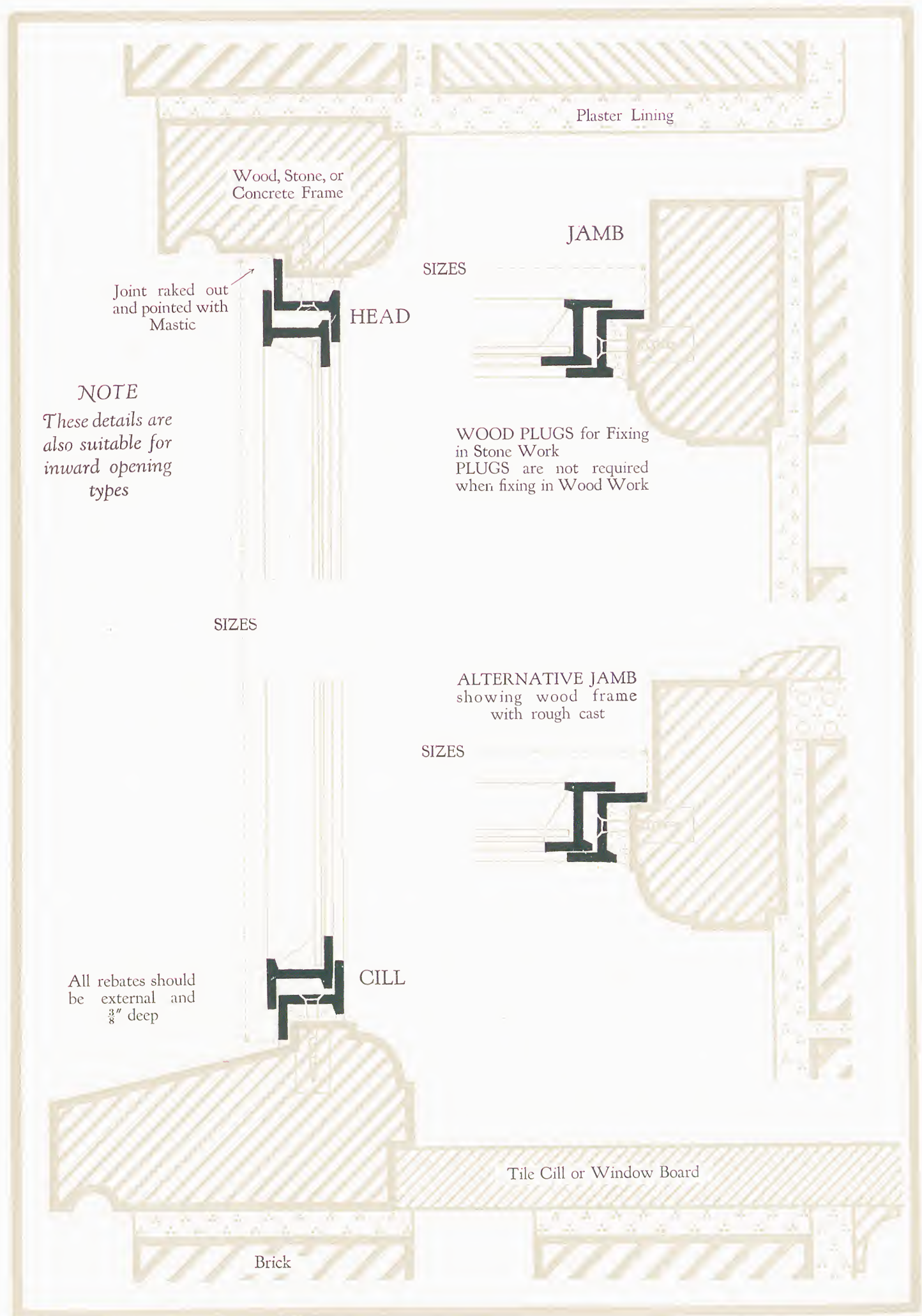
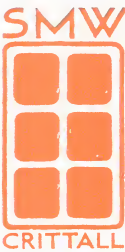
Fixing Instructions

1. Do not force a window into an opening too small to receive it. Cut away the surrounding work until the window will go freely into position.
2. In stone, brick, or artificial stone openings, mark off the position of the fixing holes, and having cut the holes, insert elm plugs.
3. Fill the channel of the frame with mastic, and press the window against the rebate.
4. Screw the casement to the plugs (or wooden frame), taking care not to distort it by driving the screws in too tightly, then trim off the mastic, and point firmly into the external and internal joint.

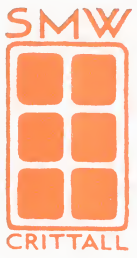


HOUSE AT SOUTH CAVE, near HULL
Architects : BLACKMORE, SYKES & Co.

FIXING DETAIL No. 6



INSTALLATIONS



HOUSE AT STAND, WHITEFIELD, near MANCHESTER
Architects : T. A. FITTON & SON



HOUSE AT SURBITON
Architect : JOSEPH HILL



HOUSE AT NEWLAND PARK, HULL
Architects : WHEATLEY & HOULDSWORTH



HOUSE AT DEGANWY
Architects : T. A. FITTON & SON



BUNGALOW, JOHANNESBURG
Architect : H. W. SPICER



HOUSE, JOHANNESBURG, S. AFRICA
Architect : H. PORTER



HOUSE AT GRAVESEND
Architect : L. D. TOMLINSON



HOUSES AT ALTRINCHAM
Architect : PHILIP H. CUNDALL



HOUSE AT BEXHILL
Architect : GEO. HERBERT GRAY



HOUSE AT MENSTON, YORKS.
Architect : OSWALD WHITE



HOUSE AT DEGANWY
Architects : T. A. FITTON & SON



HOUSE AT NEWBY, SCARBOROUGH
Architects : WATSON & RITSON



HOUSE AT RUISLIP
Architect : F. HERBERT MANSFORD

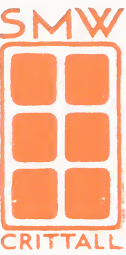


HOUSE AT THE HAGUE, HOLLAND
Architect : J. B. WOLBERS



HOUSE AT
ZWALUWENBERG
HOLLAND

Architect :
FOEKE KUIPERS



HOUSE AT
BAARN, HOLLAND

Architects :
G. H. KLEINHOUT
& A. J. VAN DER STEUR



HOUSE AT
BILTHOVEN

Architect :
H. F. MERTENS



MESSRS. BIDDLES LTD., PRINTING WORKS, GUILDFORD
Architects : F. J. HODGSON



HOSPITAL AT ROYSTON, HERTS.
Architect : BARRY PARKER



HOUSES AT STONELAW, RUTHERGLEN
Architect : GEORGE A. BOSWELL



TENNIS PAVILION, ALEXANDRA PARK, GLASGOW
Architect : E. MATTHEWS

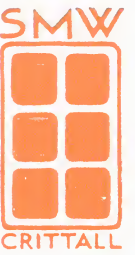


HOUSE AT FINCHLEY



BUNGALOW AT WALTHAM, GRIMSBY
Architect : WILLIAM WELLS

WINDOWS FROM STOCK



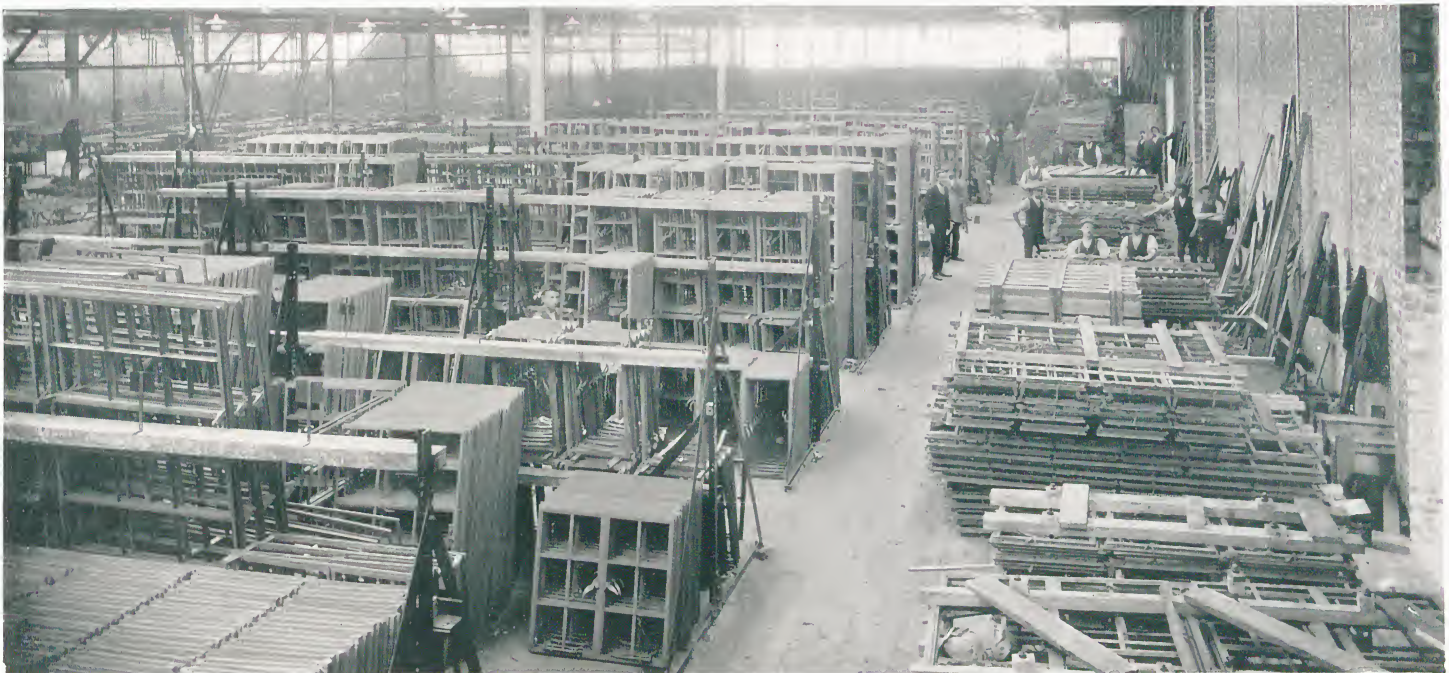
INTERIOR VIEW OF STANDARD METAL WINDOW SHOP, WITHAM

IN the five years that we have been making Standard Metal Windows we have delivered more than 2,000,000 of them, an ample proof of their worth and superiority over the wooden window. In these five years the demand has increased enormously, and we have had to build a new factory in order to deal with it. We are now extending our Witham factory to enable us to double the present output.

We feel that the nature of the House Building business demands prompt delivery,

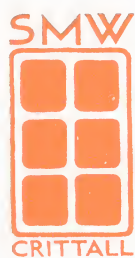
and with that object we have manufactured and always keep a stock of 20,000 windows, covering every type in the standard range of sizes, from which immediate delivery can be made.

Within reasonable distance from our Works we are prepared to deliver to the site on our own motor lorries. Besides eliminating cartage costs, all railway delays and all risks of damage or breakage during transit or unloading are avoided.



STORAGE AND SHIPPING DEPARTMENT, WITHAM WORKS

B A Y W I N D O W S



HOUSES, RUE DE ROI ALBERT, SHANGHAI
Architect : J. W. WILSON, of ALGAR & Co., LTD.

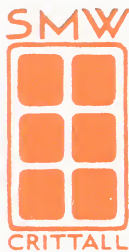
HITHERTO, Bay Windows have been constructed of masonry or wood, the angle posts forming part of the structure. The introduction of the Tubular Mullion, or corner post, has opened a new possibility, less restricted, but structurally sound.

Bay Windows of any type can be easily and economically formed, and it is now possible to construct a self-contained window several floors high, with continuous mullions, the panels between the floors being made of steel or lead ornamented with mouldings and cast enrichments.

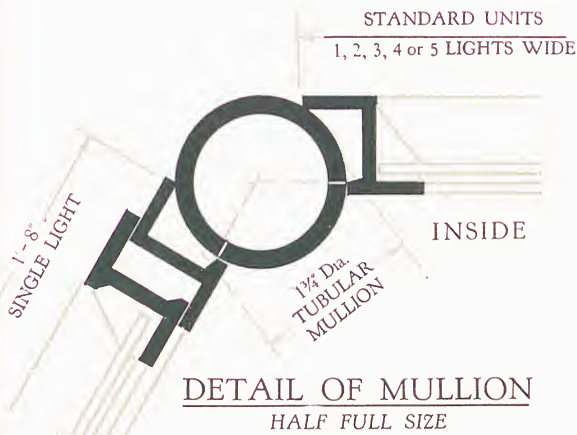
The Tubular Mullion is provided with a cast-iron flange top and bottom, drilled for fixing to the cill or lintol, the mullion itself being strong enough to carry the weight of the superstructure.

The examples of Bay Windows shown in the following diagrams only cover the more usual types. Working dimensions and types not shown here will be forwarded on application.

BAY WINDOWS

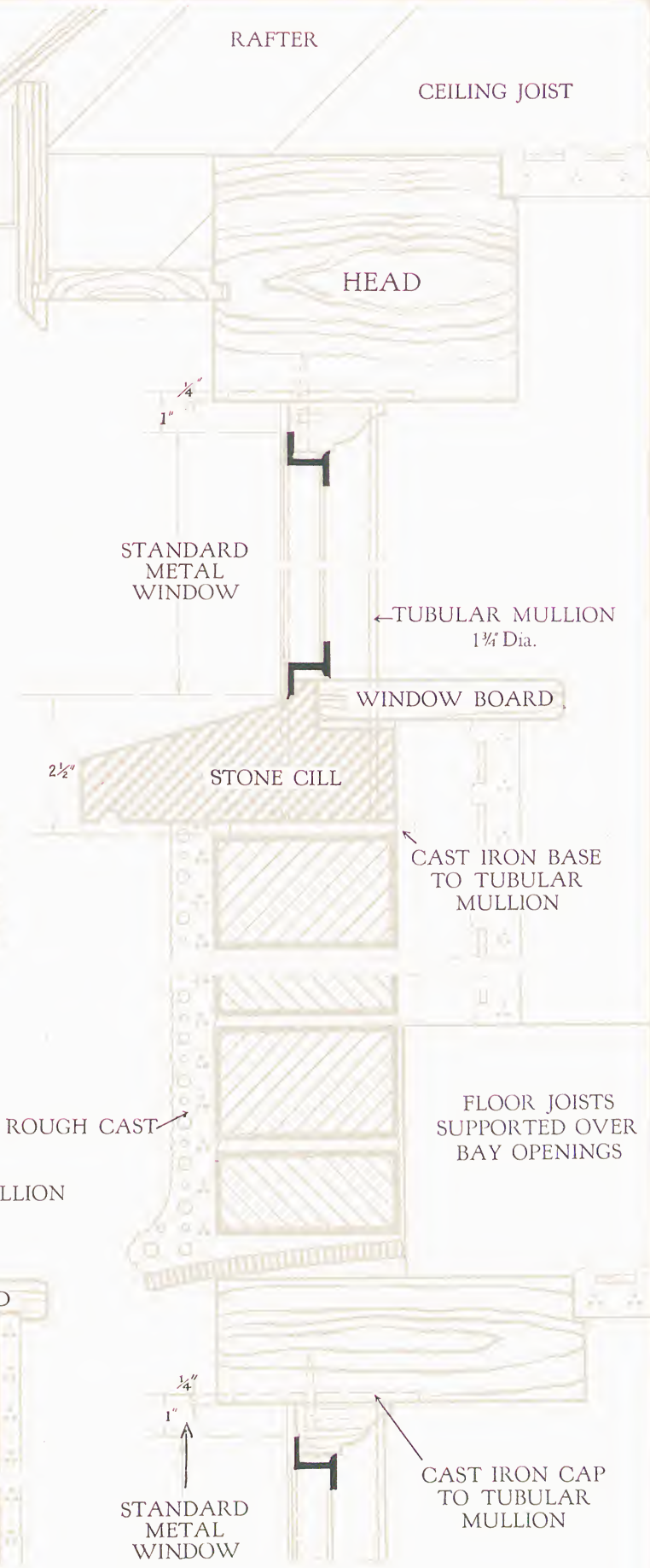
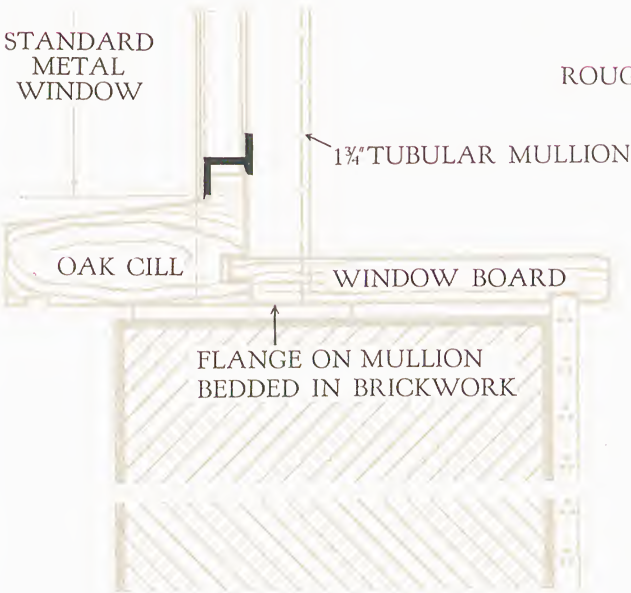


SUGGESTED BAY WINDOW DETAILS

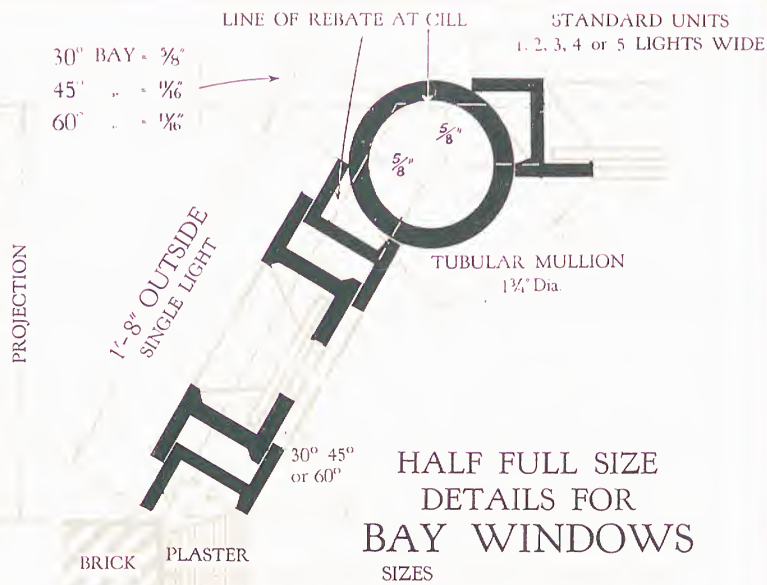
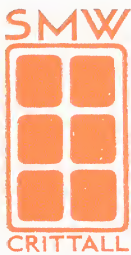


NOTE.
The slope of the
Cill should be as
steep as possible

DETAIL OF CILL
HALF FULL SIZE

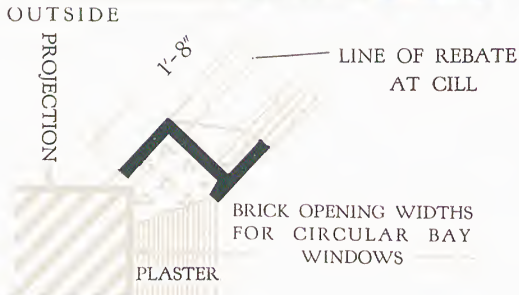


B A Y W I N D O W S

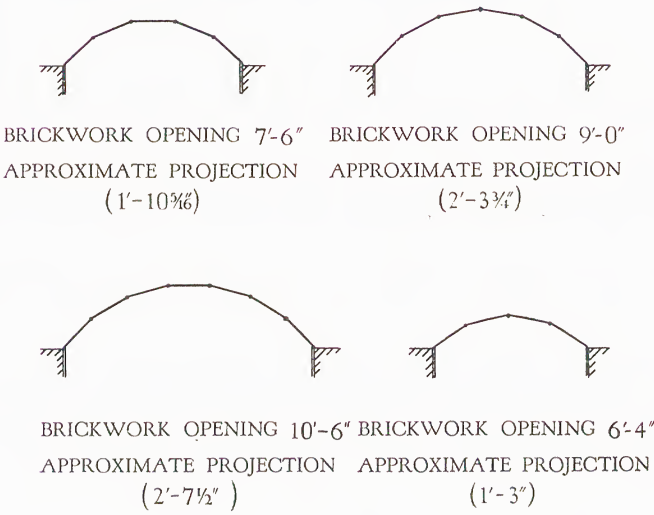


BRICK OPENING WIDTHS FOR SPLAYED BAYS

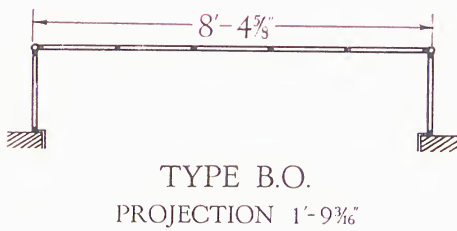
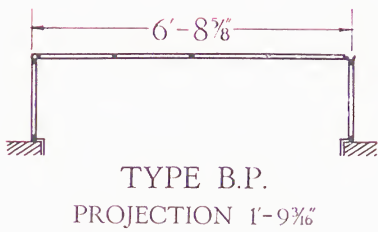
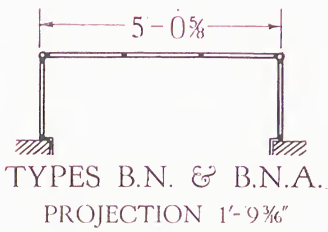
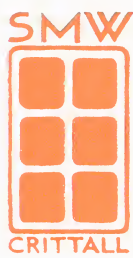
	10 3/8" PROJ.	1' - 2 3/8" PROJ.	1' - 6" PROJ.
	30°	45°	60°
ONE LIGHT WIDE, with Single Side Lights AS TYPES BA & BB	4' - 8 3/4"	4' - 2 1/2"	3' - 6 3/8"
TWO LIGHTS WIDE, with Single Side Lights AS TYPES BC, BE, BD, BF, BFA & BG	6' - 4"	5' - 9 3/4"	5' - 1 3/8"
THREE LIGHTS WIDE, with Single Side Lights AS TYPES BC, BE, BD, BF, BFA & BG	7' - 11 1/4"	7' - 5"	6' - 8 7/8"
FOUR LIGHTS WIDE, with Single Side Lights AS TYPES BH & BJ	9' - 7 1/4"	9' - 1"	8' - 4 7/8"
FIVE LIGHTS WIDE, with Single Side Lights AS TYPES BH & BJ	11' - 3 1/4"	10' - 9"	10' - 0 7/8"



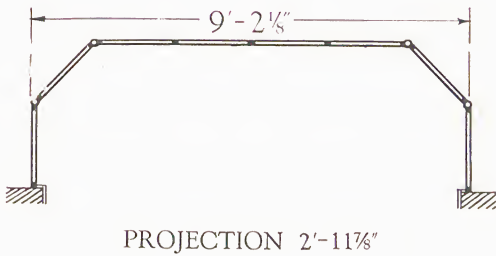
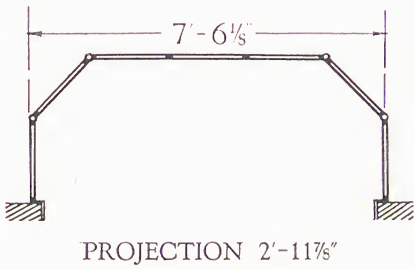
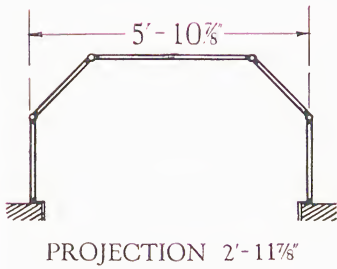
CIRCULAR BAYS



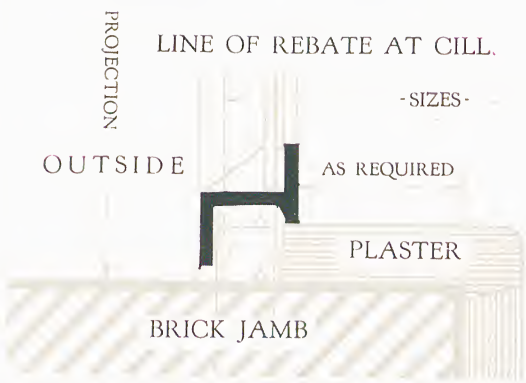
B A Y W I N D O W S



SQUARE BAYS



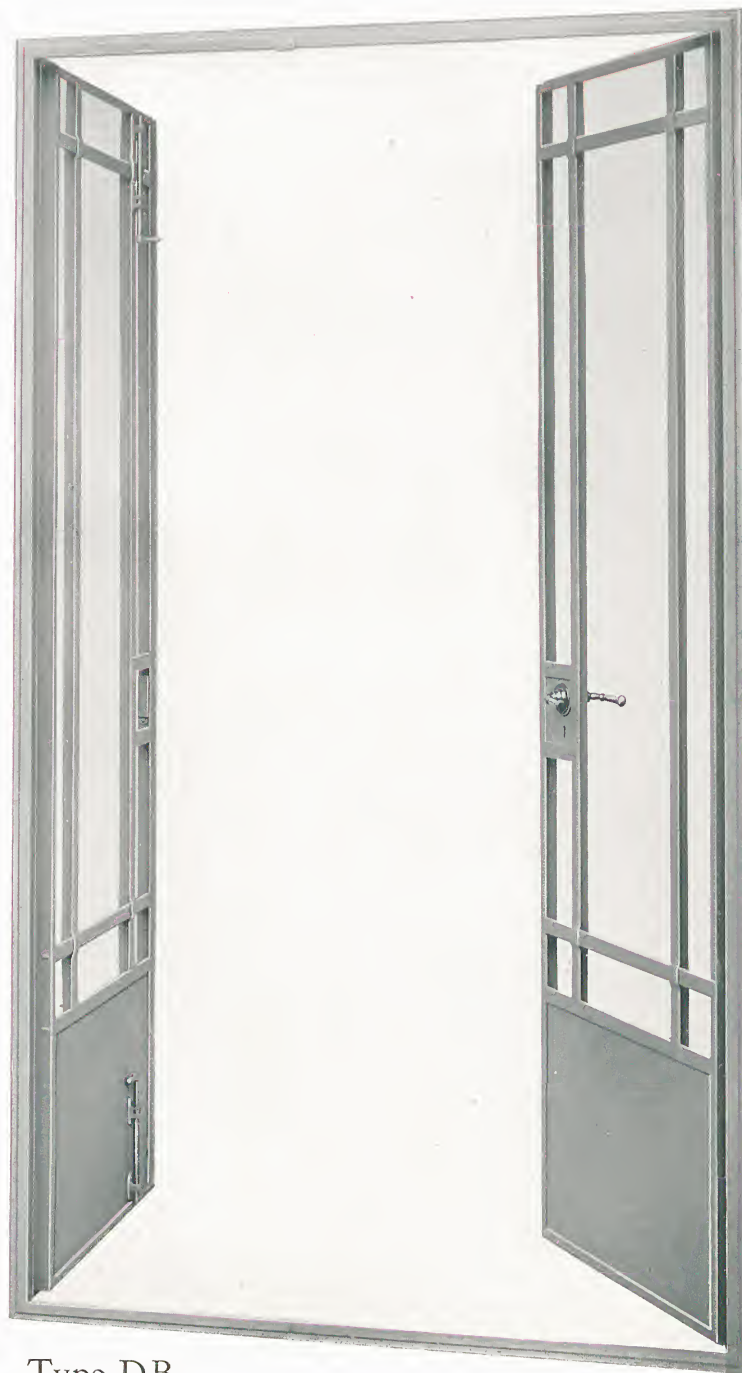
SQUARE SPLAYED BAYS



STANDARD FRENCH WINDOWS



Type DA

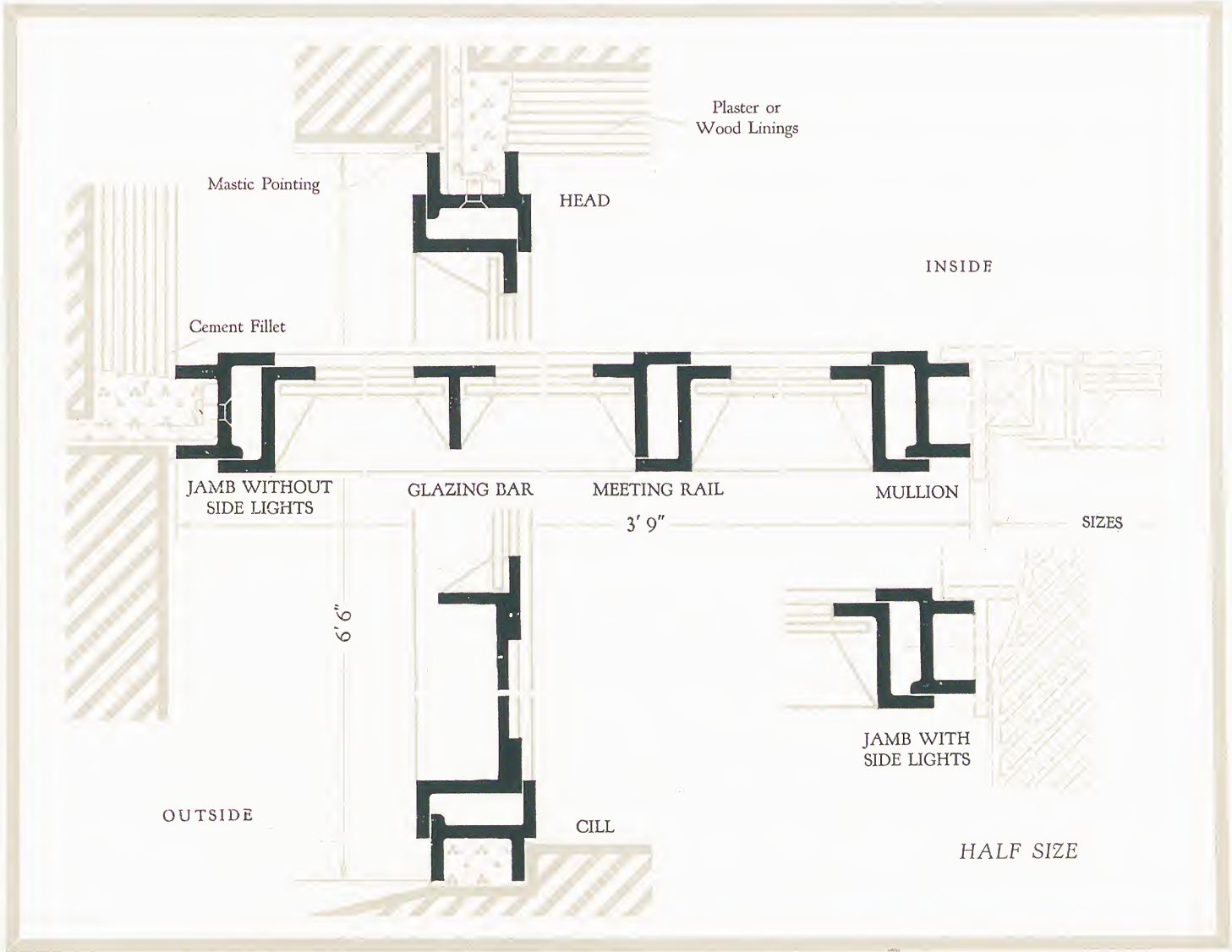
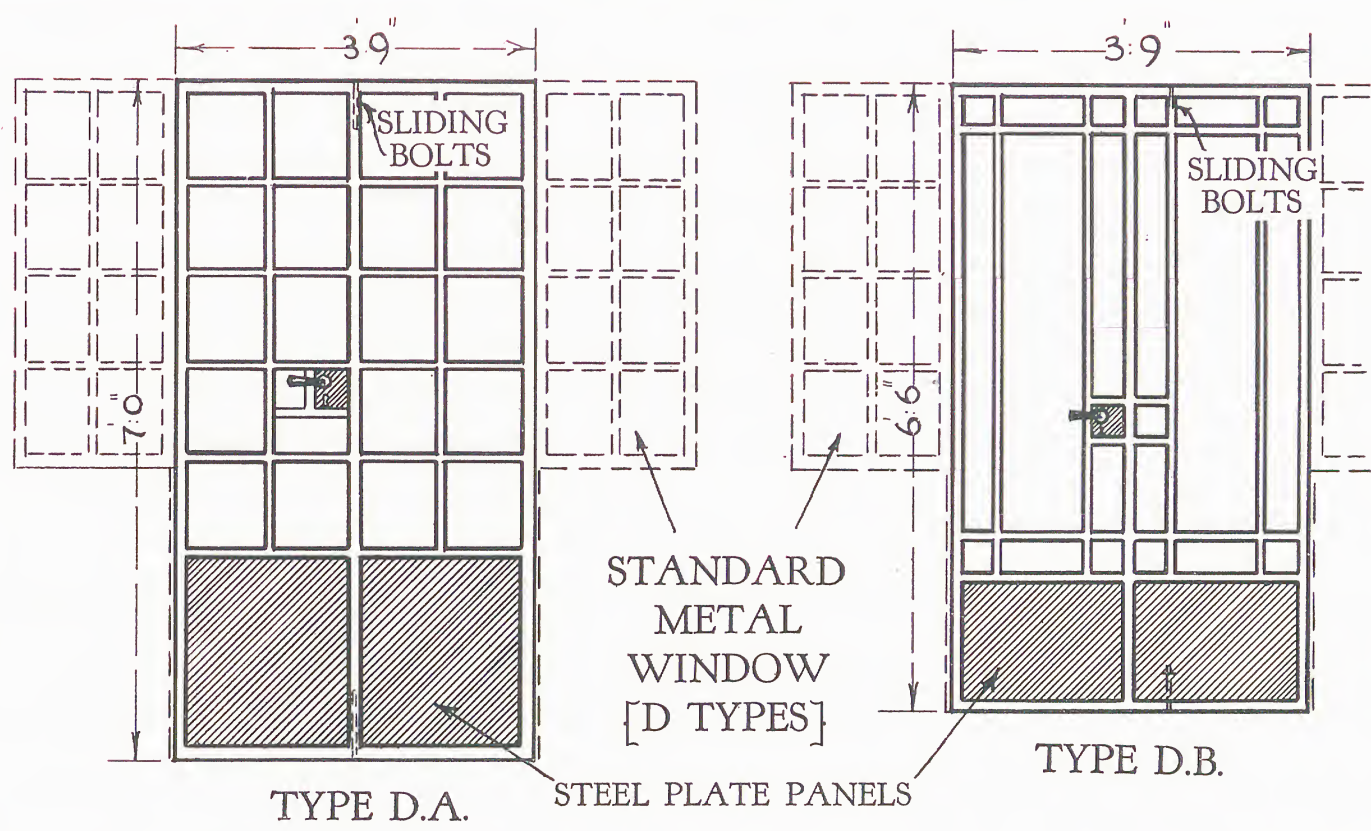
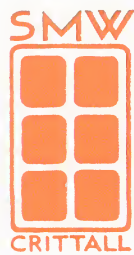


Type DB

AS a complement to the range of Standard Metal Windows described in the foregoing pages, we have now produced alternative types of Standard French Windows as illustrated above.

These are made in the folding type to open outwards, and are provided with solid steel kicking plates, sliding bolts on both leaves, and mortice lock to work from both sides.

STANDARD FRENCH WINDOWS



STANDARD FENESTRA SASHES



SPECIFICATION

GLAZING SIZES

These sashes are made of tee section with Fenestra joints. The glass size for all fixed panes is 18" × 12", for ventilator middle panes 16 $\frac{7}{8}$ " × 12", and for ventilator side panes 16 $\frac{7}{8}$ " × 10 $\frac{7}{8}$ ".

MULLIONS

Any number can be coupled together by means of Standard Tee Mullions and Transomes.

FITTINGS

The Fittings are in all cases very substantial and suitable for the heavy duty they will be called upon to perform. Rivets are used in preference to screws for their attachment. The horizontal centre-hung windows are provided with a push-out pressed steel stay, or, alternatively, a malleable spring catch, where the former fitting is inaccessible. A malleable iron handle and pressed steel stay are provided for the escape ventilators.

HINGES

The ventilators are horizontally centre-hung on pressed steel pivots. These are easily adjustable so that minor inaccuracies of erection or glazing can be easily corrected.

SPECIAL VENTILATORS

A special range of Side-Hung Ventilators is provided in the Standard type for emergency fire exits. These are provided with projecting hinges to enable them to be cleaned from the inside. A further range of Standard Sashes are provided with Bottom-Hung Ventilators for cases where external projection is undesirable.

All types of ventilators have double contact [two-point] weathering, and, as all the attachments of weathering to frames are concealed, there is no danger of corrosion interfering with their proper function.

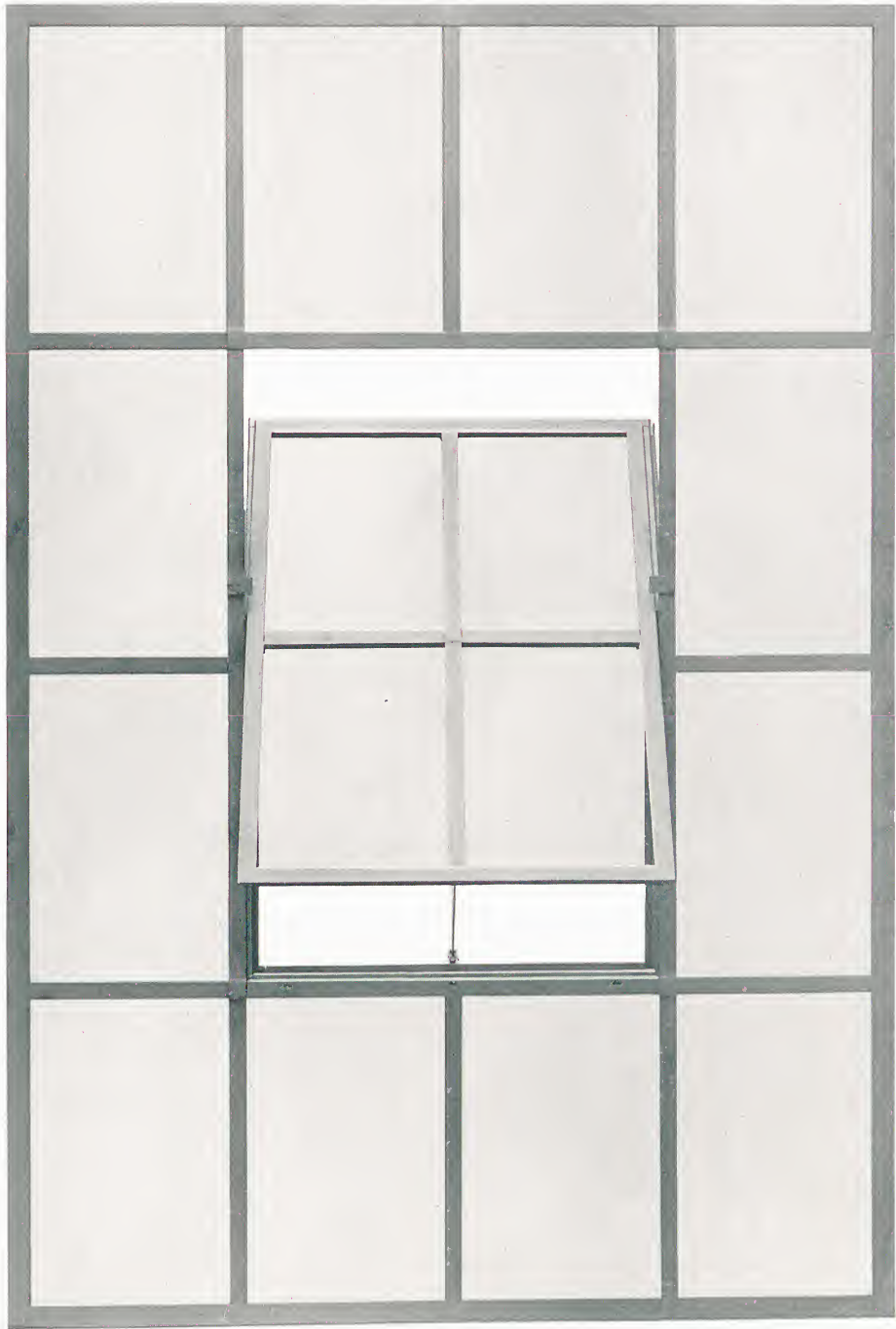
FIXING

The best results are obtained by BUILDING IN, rather than fixing them to finished openings, as, besides insuring a sound joint with the surrounding masonry, the sash provides a guide and incentive to the bricklayer. All lugs and bolts are provided for the sashes and mullions.

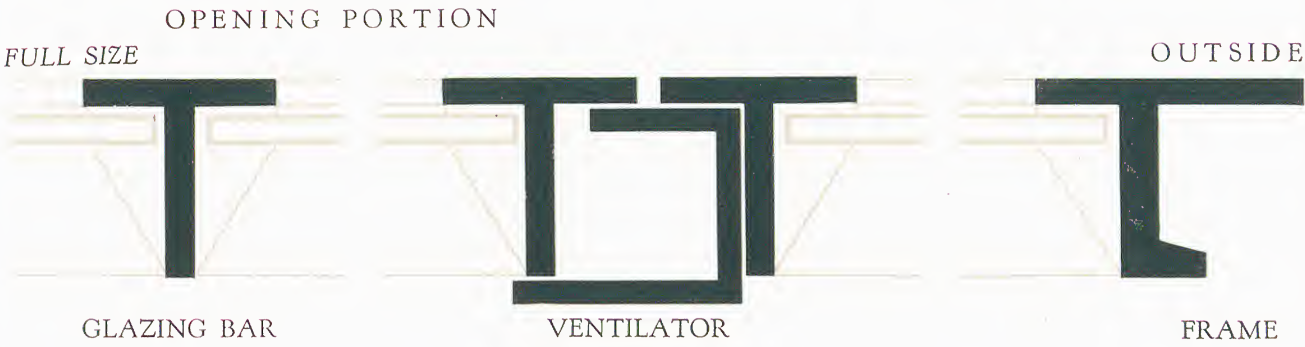
FINISH

All sashes are painted a priming coat of zinc oxide before despatch, and full fixing instructions are attached to every consignment.

STANDARD FENESTRA SASHES



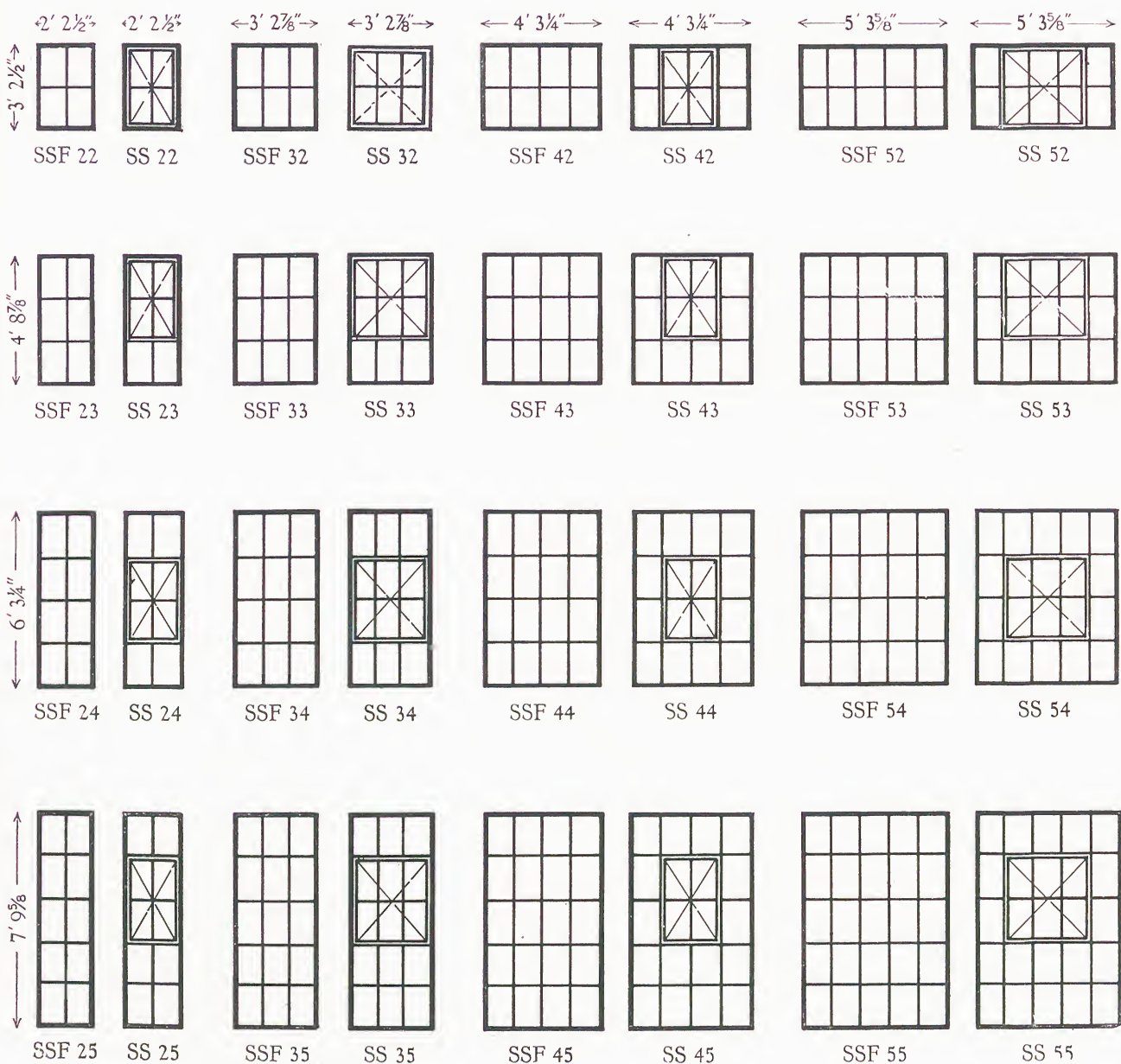
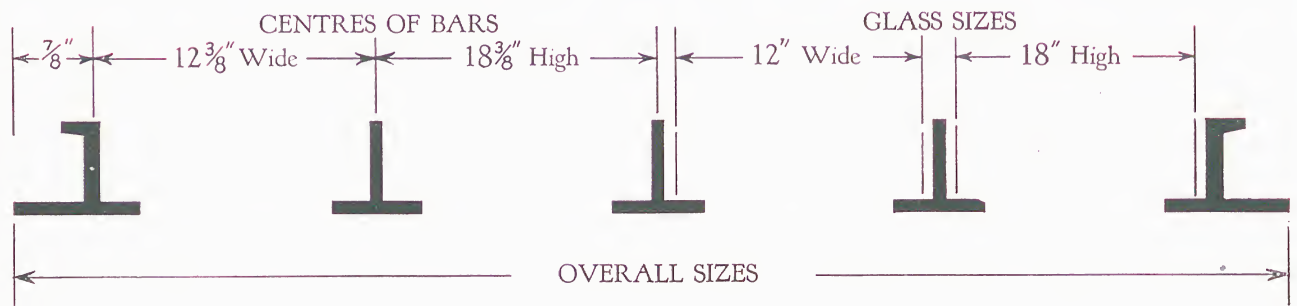
Typical Standard Fenestra Sash [Type SS 44]



STANDARD STOCK SIZES

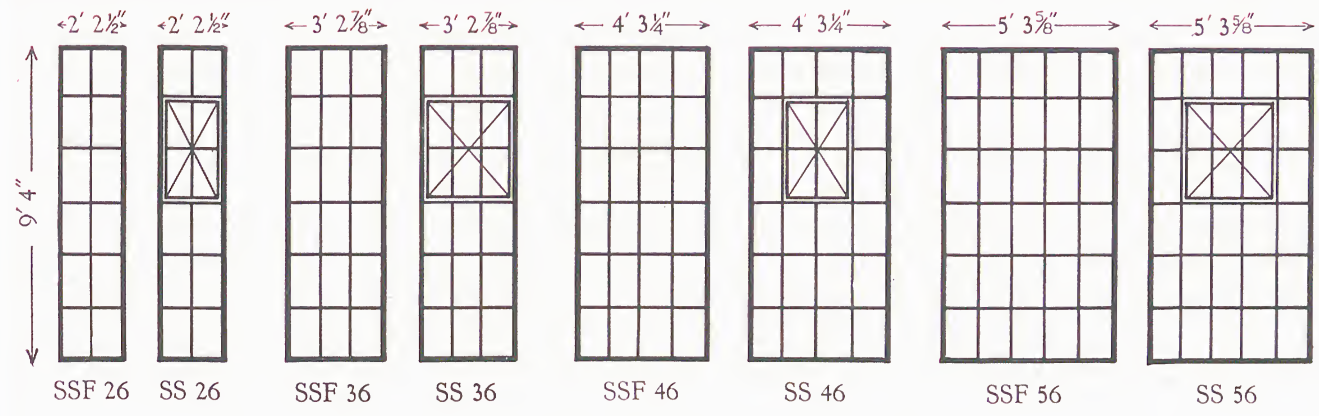


THE SIZES GIVEN ARE OVERALL DIMENSIONS OF THE WINDOW
AND ALLOWANCE MUST BE ADDED FOR GOING INTO OPENINGS

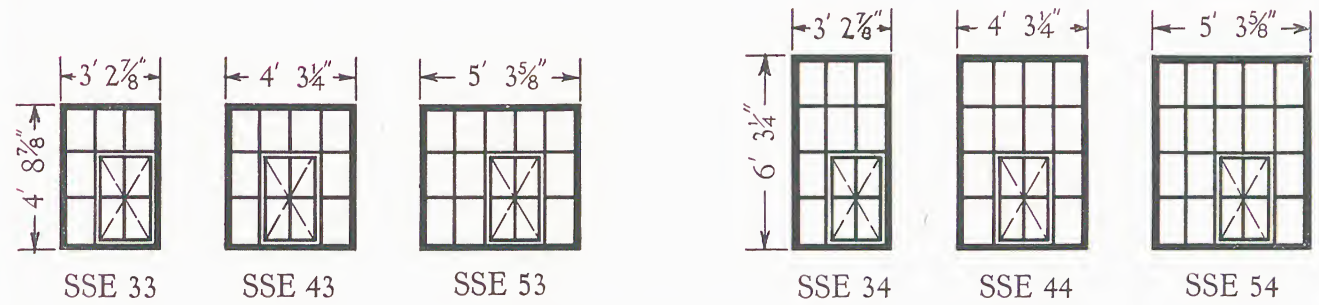


HORIZONTAL CENTRE-HUNG VENTILATORS

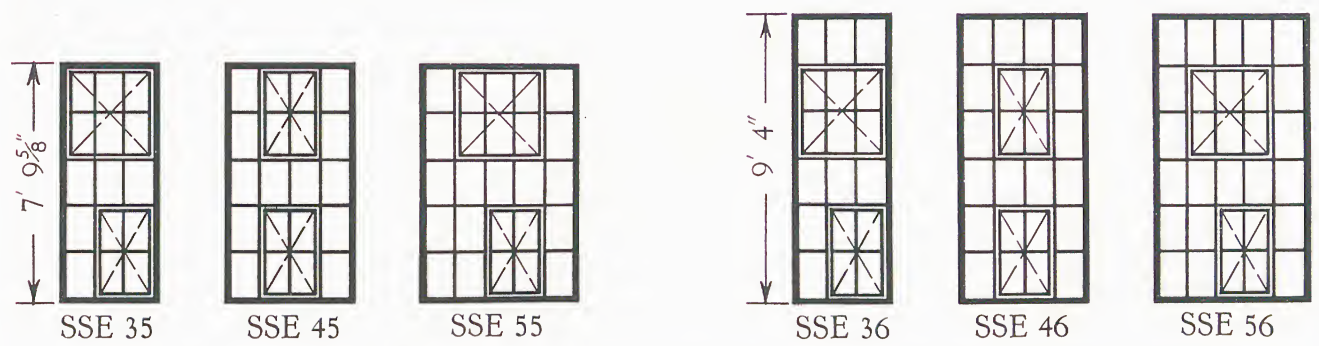
STANDARD STOCK SIZES



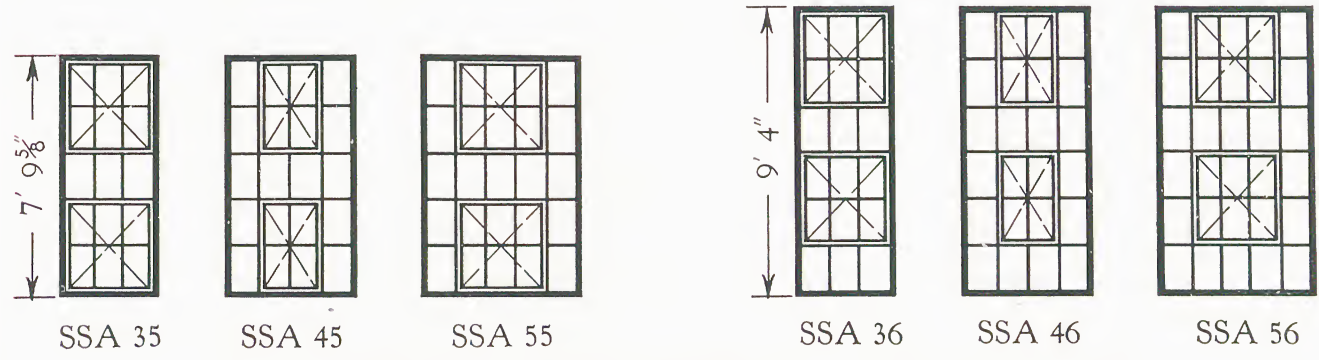
HORIZONTAL CENTRE-HUNG VENTILATORS



ESCAPE VENTILATORS

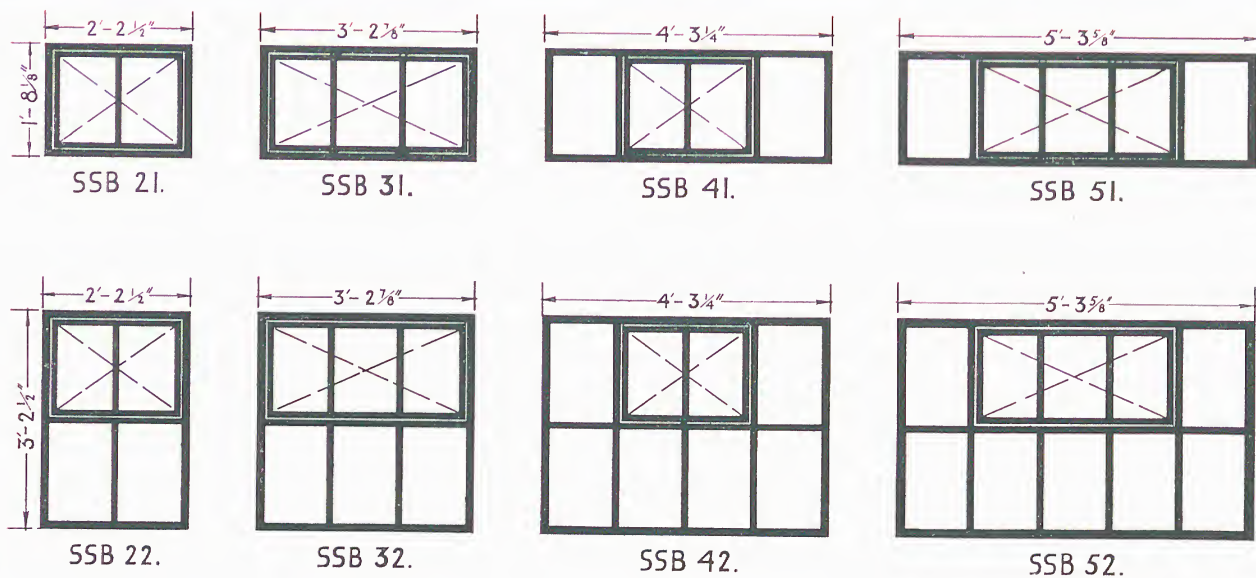


VENTILATORS IN THE LOWER PORTIONS OF THESE SASHES HINGED AT SIDE TO OPEN OUTWARDS. VENTILATORS IN THE UPPER PORTIONS OF SASHES 5 AND 6 PANES HIGH ARE HORIZONTAL CENTRE-HUNG



ALL VENTILATORS ARE HORIZONTAL CENTRE-HUNG

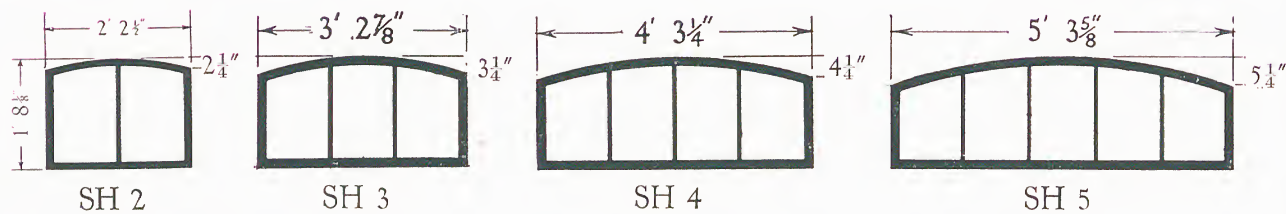
BOTTOM-HUNG VENTILATORS



THIS range of Standards has been provided for cases where it is essential that ventilators should have no external projection when open, such as lavatories, hutments, stallboards, etc.

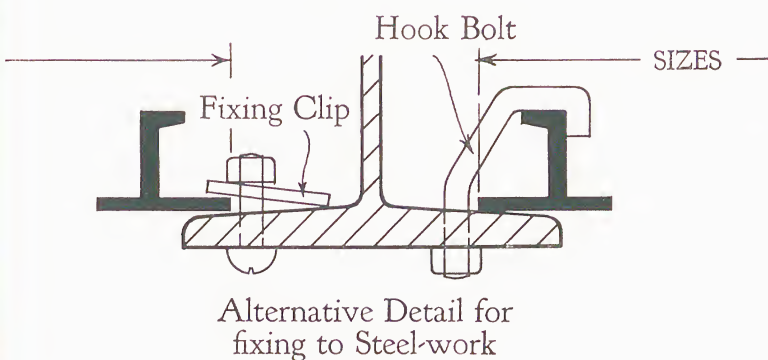
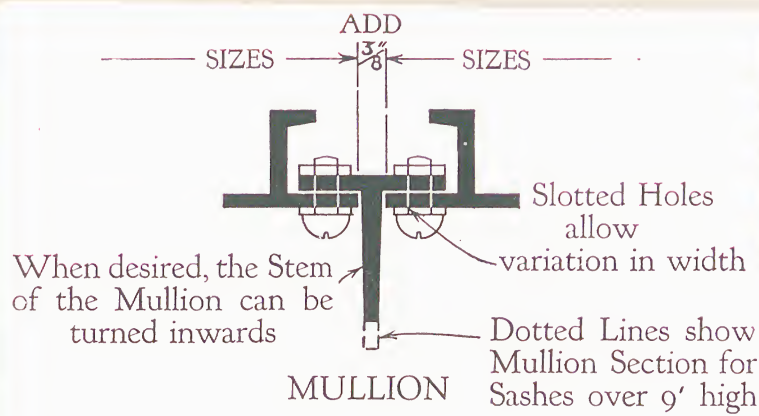
They are fitted with a malleable spring catch for operation by cord or pole, and with side arms to prevent the window falling back.

SEGMENTAL HEADS



IN certain cases it is often found necessary to construct the heads of window openings as Brick Arches, instead of using lintols of steel or concrete, and the above segmental-headed fixed sashes have been made up for attachment to any of the full range of Standard Fenestra Sashes.

COUPLING DETAILS



TWO or more units of Standard Fenestra Sashes may be combined in the same opening by joining them with our Standard Tee Mullion or Transome as shown above.

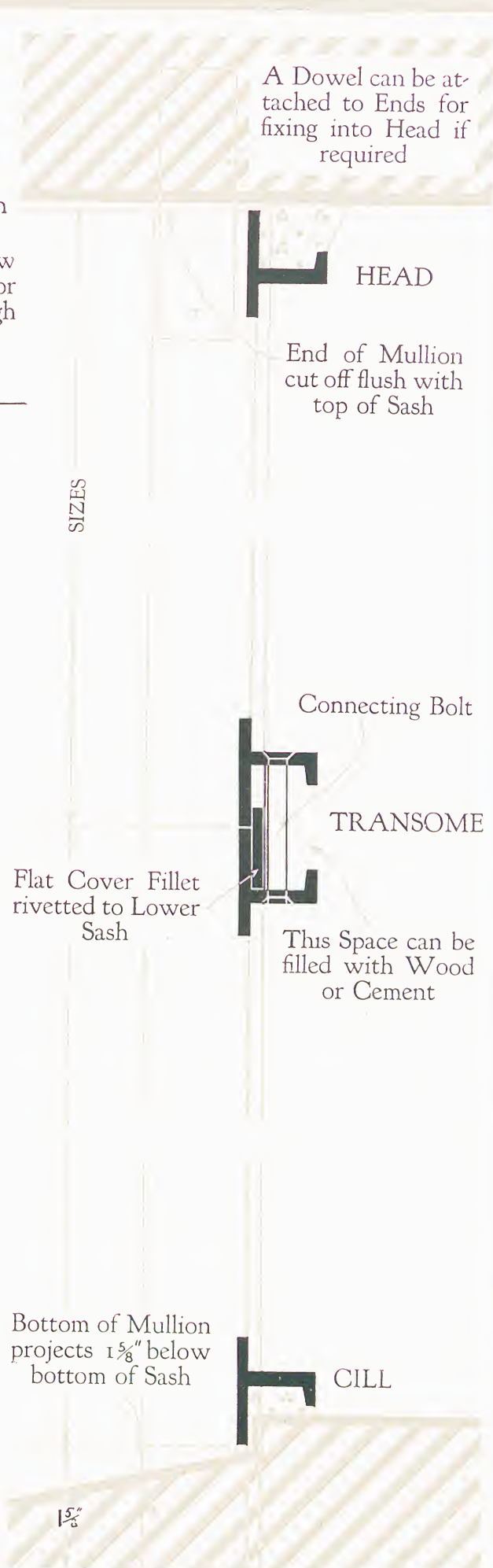
The Mullions are punched with SLOTTED holes, which allow a slight variation in the overall width of the completed window.

All Mullions are provided to project $1\frac{5}{8}$ " into the cill.

They are cut off flush at the top, but a dowel can be fixed for building into the head where the construction of the lintol allows for this.

In openings where both mullions and transomes occur, the mullions run the full height of the opening, an extra deep section being used for the purpose.

In calculating the sizes of combined windows, $\frac{3}{8}$ " must be added for each mullion and nothing for each transome.



H I N G E S



HINGES

THE HINGES, provided on horizontal centre-hung ventilators, are *inside* the building, and 2" above the centre, securely rivetted to the weathering. By this means the hinge is protected from rust. As will be seen, the hinge itself covers the joint in the weathering.

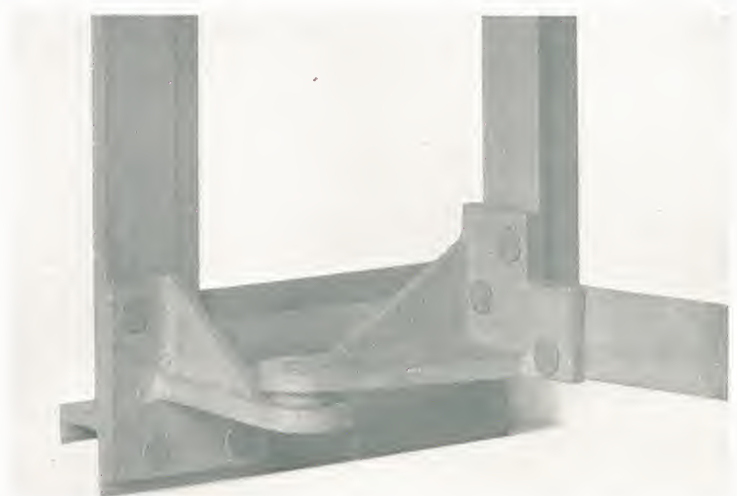
A slotted hole is provided in one of the leaves to enable the ventilator to be easily adjusted up and down. It can be entirely removed if required by taking out the hinge bolts.

CLEANING HINGES

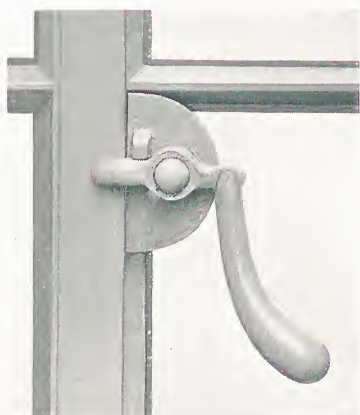
SO that all types of windows may be easily cleaned from *inside* the building, side-hung ventilators are provided with projecting hinges. These provide a space of about $4\frac{1}{2}$ " between the sash frame and the ventilator when open, which is sufficient to allow the arm to pass freely.

These hinges are made of malleable iron with gunmetal centres.

Bottom-hung ventilators are hung on steel butts.



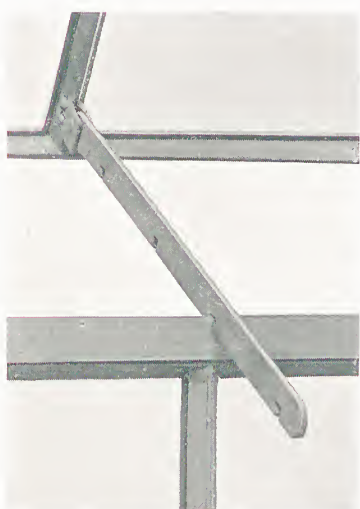
CLEANING HINGE ON SIDE-HUNG VENTILATORS



HANDLE

SIDE-HUNG VENTILATORS

Side-hung Ventilators are provided with malleable iron handle of this pattern. It is of substantial design, securely rivetted to the frame.



STAY

HORIZONTAL CENTRE-HUNG VENTILATORS

The Standard fitting for this type of Ventilator is a Push-Out Stay of the pattern illustrated. It is notched to allow the Ventilator to be set open at various positions, and secure fastening is ensured by placing it behind the clip attached to the fixed sash-bar immediately below.



SPRING CATCH

HORIZONTAL CENTRE-HUNG VENTILATORS

In cases where the Push-Out Stay cannot be easily reached by hand, Ventilators are provided with a brass spring catch for operation by cords or long arm.



STAY

SIDE-HUNG VENTILATORS

are provided with Push-Out Steel Peg Stay and Tapered Peg. Both Stay and Peg are attached by rivets.

FIXING DETAILS



The Notes on page 116 should be read in conjunction with these details



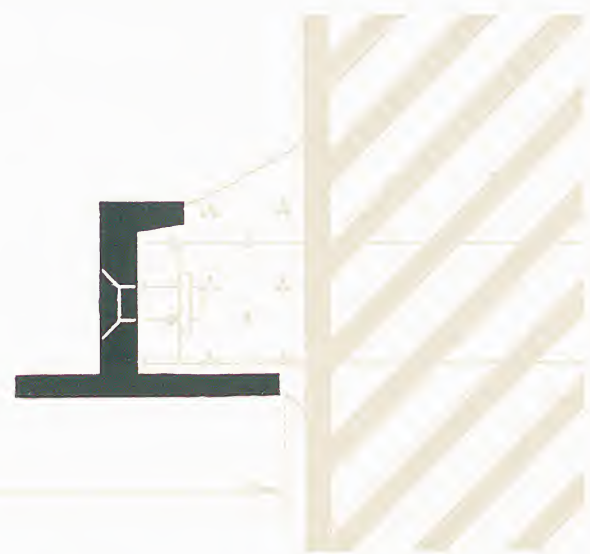
14. CONCRETE OPENINGS



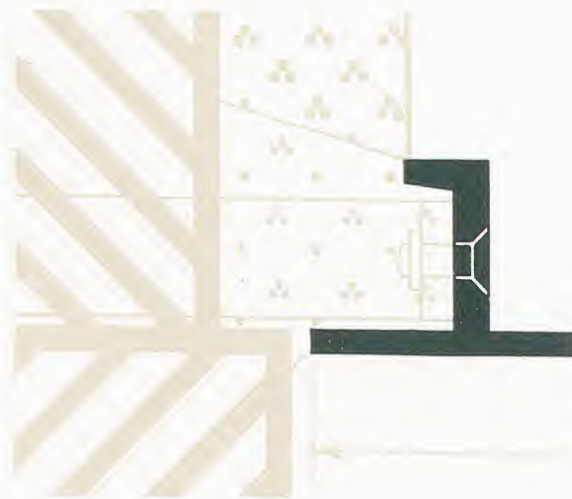
15. BRICK OR CONCRETE OPENINGS [FLUSH FINISH]



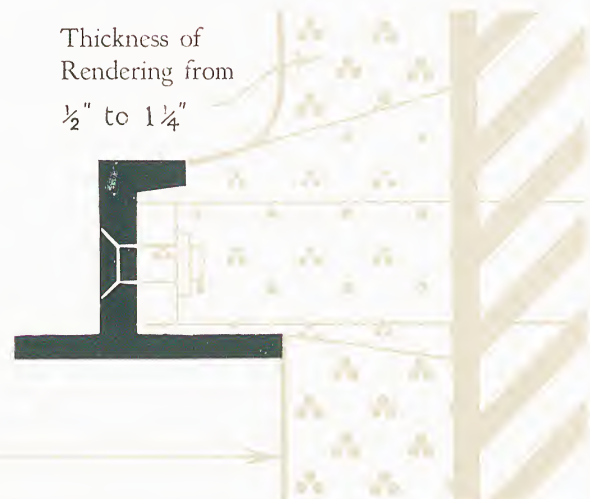
16. CONCRETE OPENINGS



17. BRICK OR CONCRETE OPENINGS [FLUSH FINISH]



18. OPENINGS WITH INTERNAL FINISH ONLY

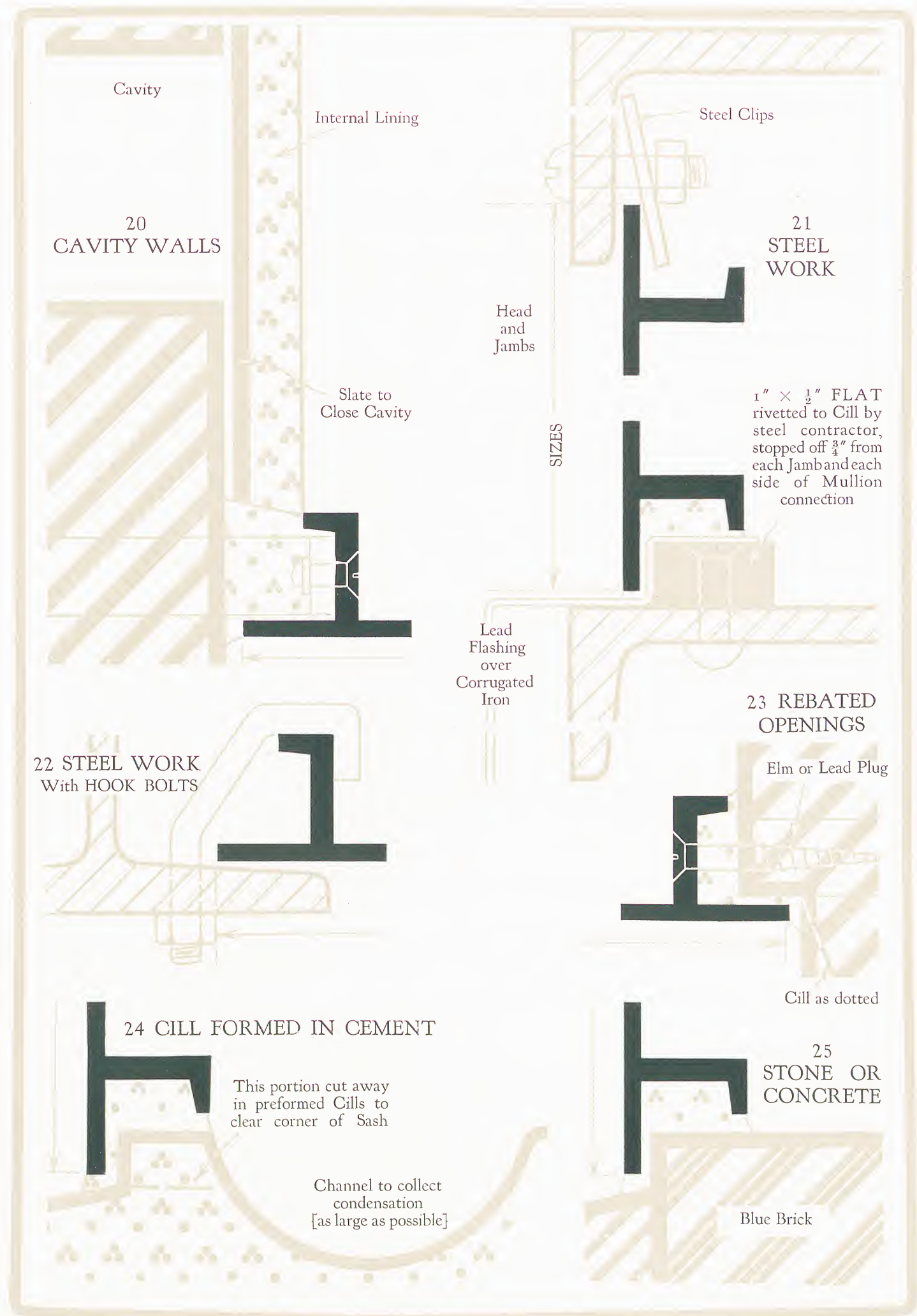


19. FLUSH WORK WITH EXTERNAL AND INTERNAL FINISH

FIXING DETAILS



The Notes on page 116 should be read in conjunction with these details



FIXING DETAILS



14 & 16. CONCRETE OPENINGS

Ordinary window openings in concrete can best be prepared with a small continuous groove as shown: this provides an internal rebate in which large sash lugs can be cemented, and does away with the necessity of cutting plug holes, which, in the case of reinforced lintols, sometimes interfere with the reinforcement.

15 & 17. BRICK OR CONCRETE OPENINGS [FLUSH FINISH]

Where ordinary brick openings are used, it is not usual to attempt to form any check or rebate at the head or jambs; quite sufficient stop is provided if the channel is well pointed with cement after fixing, or whilst they are being built in. An additional safeguard is provided if the external joint is raked out and pointed with mastic.

18 & 25. OPENINGS WITH INTERNAL FINISH ONLY

In cases where the internal jambs have to be provided with linings, either in plaster, wood, glazed brick, or other special materials, the frame should be placed in the clear opening and the internal brickwork set back sufficiently to accommodate the internal lining, whatever it may be. The joint between the sash and the masonry is formed with a cement fillet, well tamped into the channel of the sash. Detail No. 25 shows the cill suggested for use in such cases.

19. FLUSH WORK WITH EXTERNAL AND INTERNAL FINISH

Where it is necessary to render the external face of the brickwork, the openings must be kept large enough to provide a space between the sash and the masonry sufficiently wide to accommodate the external rendering. In this case, as in Detail No. 17, the actual joint should be made whilst the sash is being built in with cement. Internal linings, if any, can be finished against this cement fillet.

20. CAVITY WALLS

In cases where sashes are used in cavity wall buildings, they should be fitted in the middle

of the outer course, preferably built in as the work proceeds. Owing to the varying sizes of brickwork, it has not been found possible to arrange the lugs to correspond with the joints. The cavity itself can be closed by a piece of slate, and the lining covering this can be cut off in the reveal, if it is not required to finish the internal face of the building.

21. STEEL WORK

Steel Sashes can be easily fixed to Steel Work, and this detail shows the best application for such buildings, either in corrugated iron or brickwork. In fixing sashes to steel work, it is always advisable to avoid any attempt to make holes in the steel work to correspond with holes in the sash, and the detail shown avoids this. The steel stop shown rivetted to the cill $\frac{5}{8}$ in. from the outside face, forms an efficient stop, and flashing, in the case of corrugated iron, can be trimmed over this before the sash is applied. It must be stopped off $\frac{3}{4}$ in. from each jamb and each side of mullion, to allow side bars of sash to run through.

Detail No. 22 shows an alternative method to the clip shown on the head and jamb for the steel work of Detail No. 21.

NOTE.—Hook bolts or clips will be supplied in place of lugs when specially called for.

23. REBATED OPENINGS

It is occasionally necessary to fix sashes into framed openings, either in moulded brick, stone, or wood. In such cases, frames should be prepared with a $\frac{3}{8}$ in. external rebate. The use of wood, however, as a framing, is not recommended.

24 & 25. CILLS

Cills are usually formed after the sash has been built in, by pouring them in concrete. In such cases they can take any form dictated by special requirements. The large groove shown on the internal portion of Detail No. 24 will be found useful where excessive condensation is likely to be experienced. It should be made large enough to hold the maximum amount anticipated, so that it may evaporate during day-time, as attempts to drain this away to the outside are liable to give trouble.

FIXING INSTRUCTIONS

THESE INSTRUCTIONS should be read in conjunction with details on pages 114 and 115.

Standard Fenestra Sashes are subjected to careful inspection both during manufacture and before despatching. If properly handled during transportation, and erected according to the following instructions, they will operate in an entirely satisfactory manner when installed in the building.



HANDLING AND STACKING

Fenestra Sashes should ALWAYS BE STACKED ON EDGE and never piled one on top of the other. Do not lay the frames flat or drag them along, as rough handling will distort them. INSPECT THE SASHES CAREFULLY before placing in the opening, to be sure that they have not been twisted or bent. Any bars bent in handling can be easily straightened with a hammer. They should be covered up until ready for use.

FOR BRICK BUILDINGS

The best method when Standard Fenestra Sashes are used in brick buildings is to BUILD THEM IN as the work proceeds. This ensures a sound joint with the brickwork and prevents the possibility of misfit. In such cases the sash should be stood in position, and plumbed, levelled and adjusted, and lugs bolted on. The ventilator, after being tried to see that it opens and closes properly, should be wired shut. The sash should then be braced and strutted securely. The supports should not be removed until the brickwork has reached lintol height.

In some cases, such as Concrete and Steel Frame Buildings, it is not possible to erect the sash until after the opening is formed.

Care must always be taken to protect the sash from misuse during erection. Sash bars are not intended to support scaffolding or ladders, and

will be damaged if so used. Ventilators must be kept shut until ready for glazing.

CILLS

All Cills must be level. If the cill is not level, place a wedge under the corner of the frame. Sashes should be bedded in cement when placed upon cill prior to erection.

In cases where concrete cills are poured AFTER the sash has been built in, care must be taken to see that the temporary blocks on which it rests are under vertical bars running the full height of the sash.

Where cills have been formed to suit sash [see Detail 24] the stool must be cut away at the corner of each sash unit, to clear the ends of the vertical member.

JAMBS

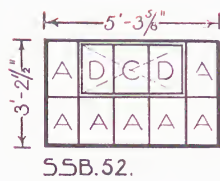
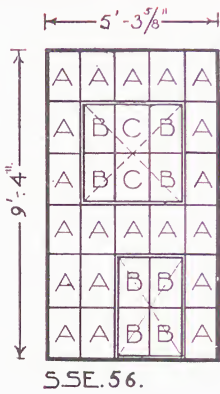
In built openings, be sure that jambs are plumb. Do not force jambs to follow the lines of poor masonry, but be sure that it is free at both sides. In Detail 18, the interior brick opposite each lug should be removed, and lugs cemented after sash has been adjusted.

Be sure in all cases that lugs are free from masonry before cementing.

HEADS AND LINTOLS

Standard Fenestra Sashes are not designed to carry any load at the head. In placing frames under steel lintols, make allowance of from $\frac{1}{8}$ " to $\frac{3}{8}$ " for deflection, depending on the width of the opening.

GLAZING AND PAINTING



NET GLASS SIZES

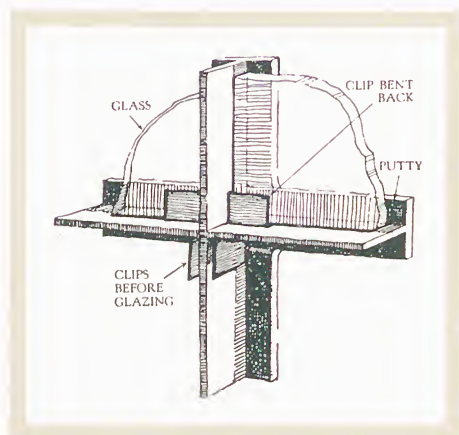
'A' Fixed panes in all types	18" × 12"
'B' Corner panes in all ventilators, except Bottom-Hung	16 ⁷ / ₈ " × 10 ⁷ / ₈ "
'C' Middle panes in all ventilators	16 ⁷ / ₈ " × 12"
'D' Corner panes in Bottom-Hung ventilators	16 ⁷ / ₈ " × 11 ⁵ / ₈ "

THE glass rebates on all Standard Fenestra Sashes are $\frac{3}{8}$ " deep, and the sizes given above allow $\frac{1}{8}$ " clearance all round. If the glass is too tight it will split.

The glass is secured by thin pressed metal strips threaded through every joint.

These are delivered folded flat against the web.

After the glass has been bedded in, these strips should be folded back against the glass and the back putty applied.



Never attempt to place glass against the metal rebate; it breaks and lets water through. Spread the rebate with a thin layer of putty, press the glass firmly against it, and trim off from the outside. Allow back putty three or four days to set before the ventilators are opened.

PUTTY AND PAINT

Ordinary glazier's putty is not suitable for

glazing metal windows, as the steel frame will not absorb the excessive quantity of oil.

It is necessary to see that only linseed oil is used [in sufficient quantity to allow the putty to be worked without being sticky]. A little mastic or red lead mixed with the putty will add considerably to its strength and permanence, whilst the addition of a small quantity of gold size will tend to make it hard, and adhere to the metal surface.

We estimate that 12 ounces of putty are required for every pane.

BEFORE APPLYING FINISHING COATS of paint, be careful to see that all rust and dirt contracted during installation are thoroughly removed.

Standard Fenestra Sashes are dipped in zinc oxide paint before despatch, but subsequent handling is liable to remove some of this, and some rust is bound to follow.

Finishing coats of paint should contain a good body of linseed oil. Care should be taken to see that the sash is quite clean before finishing coats are applied. Do not expect paint to stay upon rust or dirt.

DETAILS REQUIRED

WITH ORDERS AND ENQUIRIES



WHILST we can generally make prompt delivery of all types of Standard Fenestra Sashes, much delay is frequently caused by lack of information of what is actually required.

All orders must be accompanied by the following information:

1. Quote Detail Number of Fixing Details as shown on pages 114 & 115, particularly noting where dimension points are shown.

If none of these details meet the case, a sketch should be sent showing preparation of work at head, cill and jambs.

2. Number of each type required.
3. Quote Standard Type Numbers as given on pages 108, 109 & 110.
4. In Horizontal Centre-Hung Ventilators, whether push-out stay or spring catch is to be fitted.
With Bottom-Hung Ventilators state whether spring catch for cords or for long arm is required.
5. Whether mullions are to be cut to suit steelwork, and if so, how much. Standard mullions are cut 1 $\frac{5}{8}$ " long at cill and flush at head, and will be so furnished unless otherwise specified.
6. State the nature of building for which the sections are required.
7. Name of person to whom goods are to be invoiced, and full delivery directions.

OFFICES AND PARTITIONS



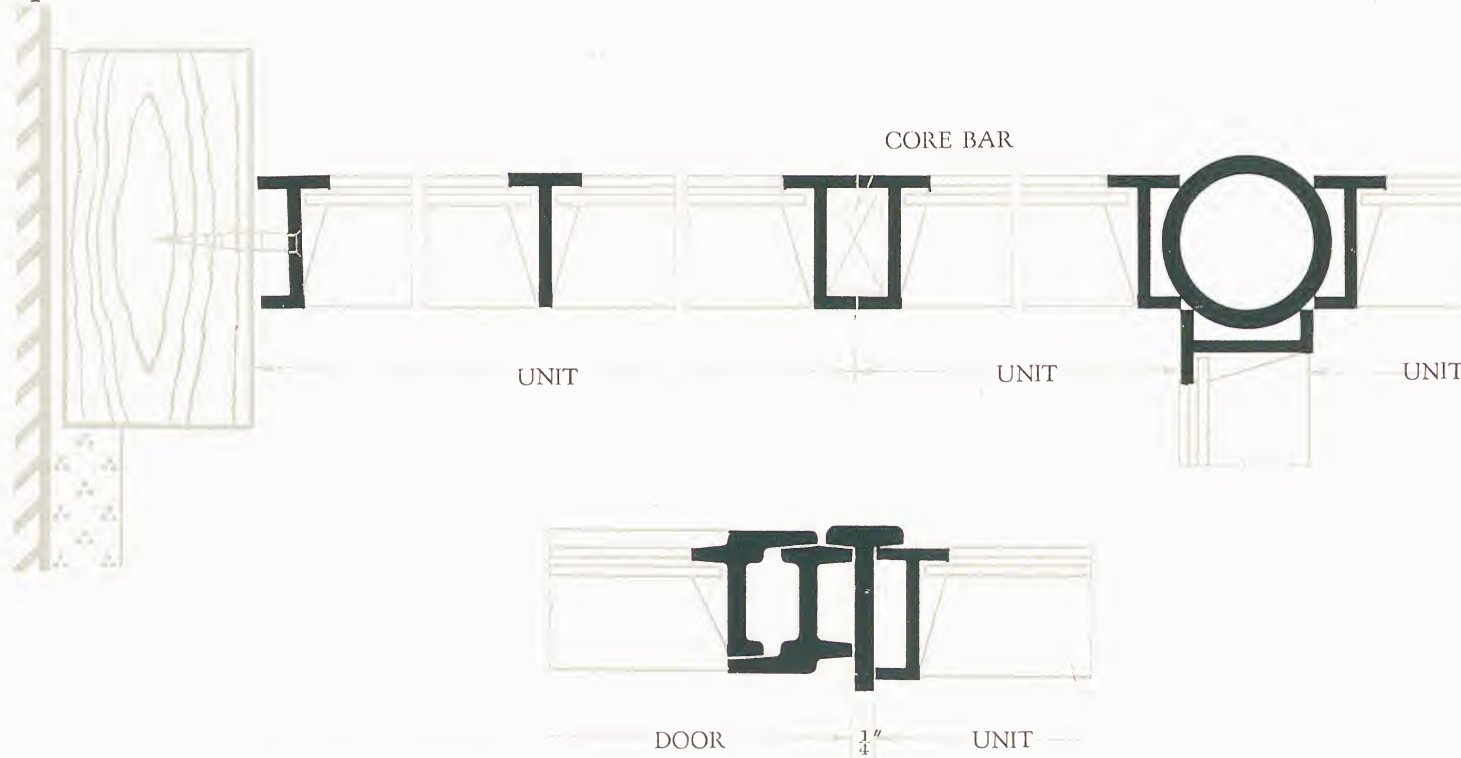
Typical Installation of Steel Partitions in a modern office building
(Note the use of Standard Metal Windows, C2, E2)

AS a means of subdividing offices, stores, and factories, glazed metal screens have the great advantage over wood in that they can be easily removed and re-erected without suffering any damage.

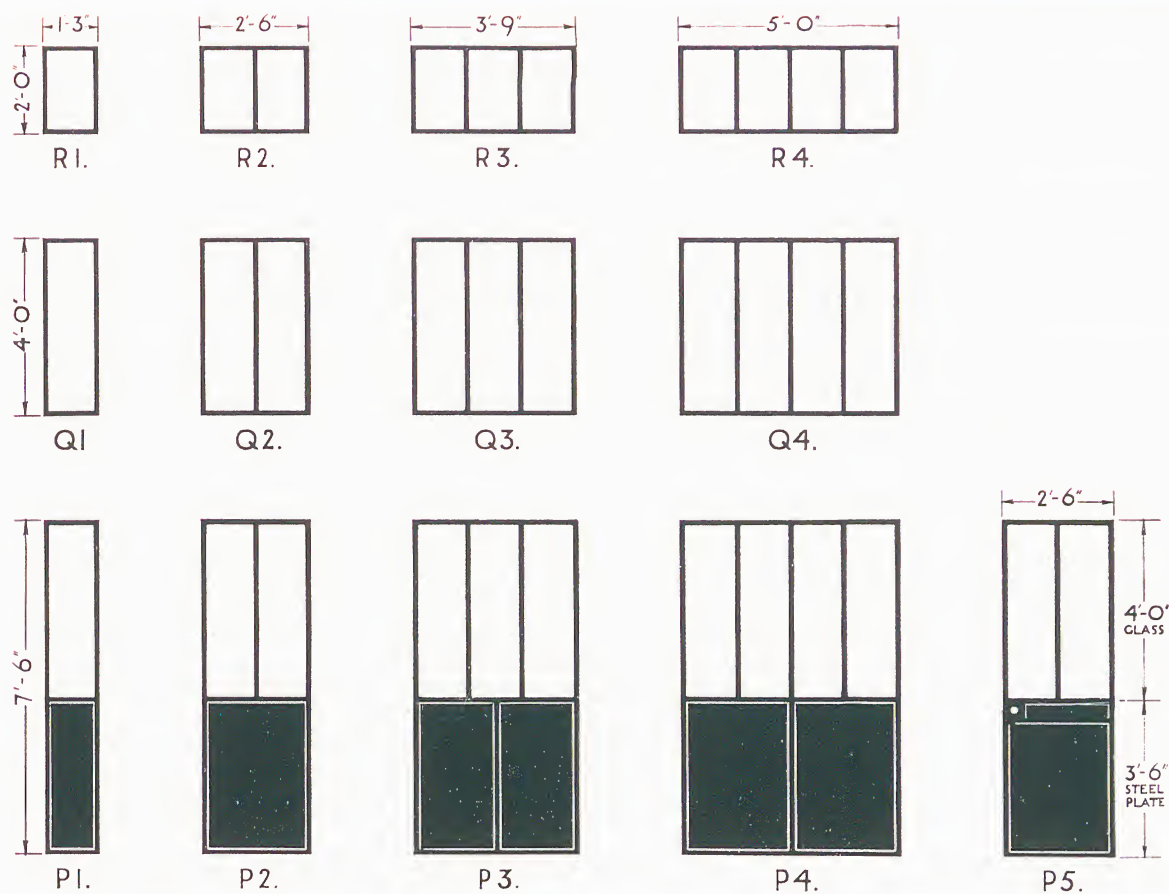
Further, they are considerably cheaper than wood partitions, offer less obstruction to light, are fireproof and occupy a minimum space.

Ever since we first standardized these panels there has been a constantly increasing demand, and we have now revised and increased the range of sizes so as to make their application more elastic.

Where the units or some of the units do not exactly fill the required space, special filling in pieces can be supplied.



OFFICES AND PARTITIONS



SPECIFICATION

PANELS, made of channel and tee sections as shown, with solid 15 B.W.G. plates welded or rivetted into the lower part.

The upper panes prepared to receive glass from inside, and prepared for wood beads where specified.

Frames drilled for countersunk fixing screws which are sent with each consignment.

Vertical tubular mullions for corner pieces

or angular connections can be supplied if desired.

DOORS, made of Medium Universal Section, hung on gunmetal hinges to open inwards. Provided with a substantial mortice lock and lever to operate from both sides.

FIXING. The most suitable method of fixing standard metal partitions is to screw them to wood plugs, or preferably, to a continuous wood curb fixed to the wall or ceiling.

GLASS SIZES

TYPE	QUANTITY	SIZE	TYPE	QUANTITY	SIZE
R 1	One piece	$22\frac{1}{6}'' \times 13\frac{1}{6}''$	Q 4	Four pieces	$46\frac{1}{6}'' \times 14\frac{1}{2}''$
R 2	Two pieces	$22\frac{1}{6}'' \times 14\frac{5}{6}''$	P 1	One piece	$47\frac{5}{6}'' \times 13\frac{1}{6}''$
R 3	Three pieces	$22\frac{1}{6}'' \times 14\frac{1}{2}''$	P 2	Two pieces	$47\frac{5}{6}'' \times 14\frac{5}{6}''$
R 4	Four pieces	$22\frac{1}{6}'' \times 14\frac{1}{2}''$	P 3	Three pieces	$47\frac{5}{6}'' \times 14\frac{1}{2}''$
Q 1	One piece	$46\frac{1}{6}'' \times 13\frac{1}{6}''$	P 4	Four pieces	$47\frac{5}{6}'' \times 14\frac{1}{2}''$
Q 2	Two pieces	$46\frac{1}{6}'' \times 14\frac{5}{6}''$	P 5	Two pieces	$46\frac{3}{8}'' \times 13\frac{3}{8}''$
Q 3	Three pieces	$46\frac{1}{6}'' \times 14\frac{1}{2}''$			

FENESTRA INSTALLATIONS



ST. ALPHAGE HOUSE, ALDERMANBURY, E.C.

Architects : Messrs. JOSEPH

AN interesting example of the use of Standard Sashes in a modern City building. It is interesting to compare the daylight area in this building with the old-fashioned building next door to it.

FENESTRA INSTALLATIONS



J. S. FRY & SONS LTD., KEYNSHAM

CRITTALL FENESTRA SASHES HAVE BEEN INSTALLED
IN THE LATEST NEW BUILDINGS AND EXTENSIONS OF
THE FOLLOWING WELL-KNOWN FIRMS:

ALLEN & HANBURY'S LTD., Bethnal Green, E.
AMALGAMATED PRESS LTD., Sumner Street,
S.E.

ANGLO-AMERICAN OIL CO. LTD., various
Branches

BOMBAY PORT TRUST, Bombay

BOOTS CASH CHEMISTS LTD., various Branches

BOVRIL LTD., various Branches

BRADBURY, WILKINSON & CO., LTD.,
Raynes Park, S.W.

BRITISH OXYGEN CO. LTD., various Factories

BRITISH PETROLEUM CO. LTD., Hackney
Wick, E.

BRITISH UNITED SHOE MACHINERY CO.
LTD., Leicester

CADBURY BROS. LTD., Bournville

A. J. CALEY & SON LTD., Norwich

COURTAULDS LTD., various Branches

CROMPTON & CO. LTD., Chelmsford

HENRY FORD & SON LTD., Cork, Copenhagen
and Brussels

FREIA CHOCOLADEFABRIK, Christiania

J. S. FRY & SONS LTD., New Premises, Keynsham

HARRODS LTD., various Branches

HOWE BRIDGE SPINNING CO. LTD., Ather-
ton

J. LYONS & CO. LTD., Cocoa Block, Greenford

MAC FISHERIES LTD., Fleetwood

MAPPIN & WEBB LTD., Sheffield

MARCONI WIRELESS STATIONS, various

NAVY, ARMY AND AIR FORCE STORES,
Kennington and Aldershot

NAVAL STOREHOUSE, H.M. Dockyard, Rosyth

W. H. SMITH & SONS, Stamford Street, S.E.

C. A. VANDERVELL & CO. LTD., Acton

UNDERGROUND ELECTRIC RAILWAYS CO.
(of London) LTD., various Depots

F I T T I N G S



THE FITTINGS used on all Crittall Casements are made from the finest material, and combine great strength with simplicity of design. They are manufactured entirely in our own Foundry, and in quality and workmanship are in keeping with the rest of our products.

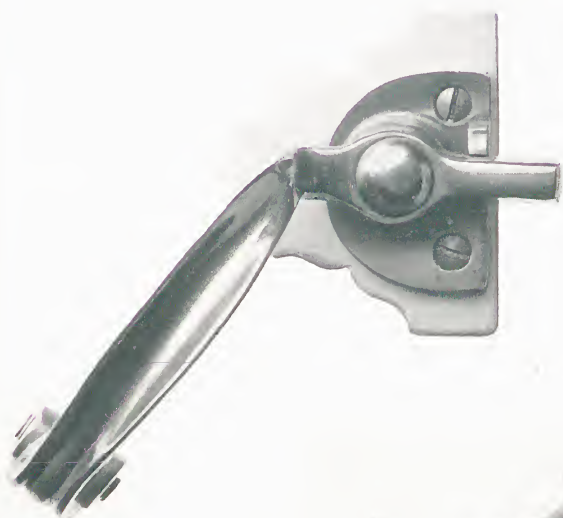
THE FINISH of our gunmetal fittings is dull bronze, great care being taken to obtain a pleasing tone and to avoid the polished or lacquered effect common to so many standard fittings on the market.

ALL FITTINGS are interchangeable, and

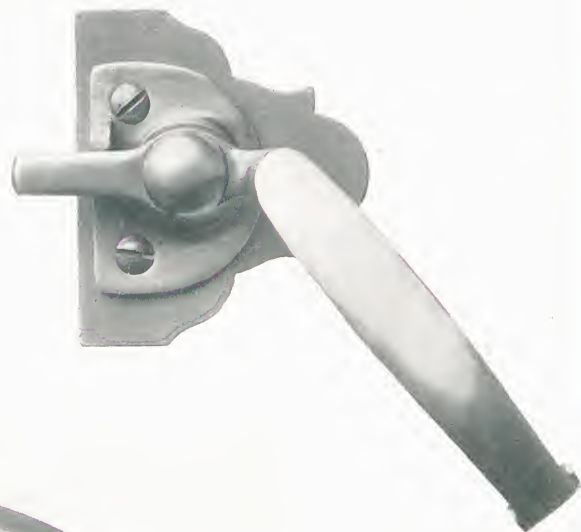
are packed loose from the casement, and should not be assembled and attached till after the casement has been fixed and glazed. This eliminates all chances of damage to the fittings in transit, or theft, pending the completion and occupation of the building.

CARE must be taken in attaching fittings to see that all screws are properly tightened and the ends cut off and rivetted over, so as not to interfere with proper contact. All screws should be greased before being used. The working parts of all fittings should also be occasionally oiled.

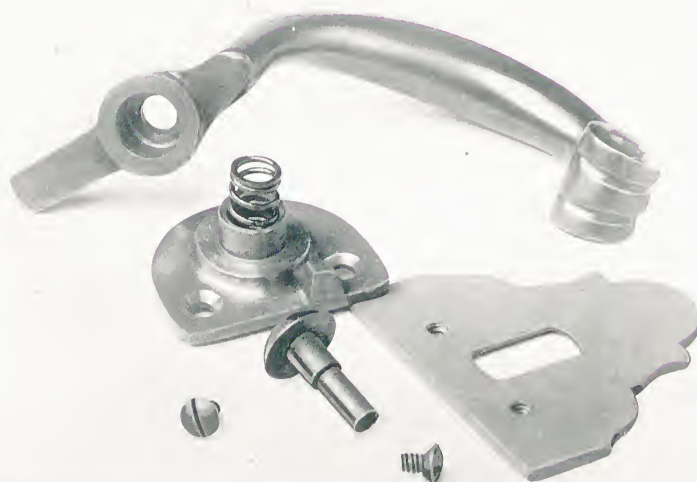
HANDLES



HANDLE No. 206
ON PLATE 325



HANDLE No. 202
ON PLATE 325



PHOTOGRAPH OF HANDLE PARTS, UNASSEMBLED

SPECIAL FITTINGS



Copy of old Wrought
Iron Casement Latch



Casement
Handle



Espagnolette Box and Lever
Handle for Folding Doors



Casement
Handle



Bow Handle for
Swing Doors



Espagnolette Handle
and Box for
Folding Casements



Bow Handle for
Swing Doors

THE ABOVE are a few examples of Fittings made to
Architects' special requirements



H A N D L E S

TWO-THROW HANDLES are fitted to all Side-hung or Vertical Centre-hung Casements over 5' 6", to ensure the window making proper contact with the frame all round when closed.

ESPAGNIOLETTE BOLTS are used on Folding Casements and French Windows, whether opening outwards or inwards, when it is required to operate them from inside only.

When locks or latches are required they are fitted as shown on page 13



No. 206.
TWO-THROW
HANDLE
ON PLATE 325



THE LOCKS on Crittall Doors are of the Mortice type fitted as shown in illustration on page 13. They are made in three grades for use on doors of different size and quality.



No. 108.
ESPAGNIOLETTE
BOLT

PEG STAYS



No. 105



No. 106

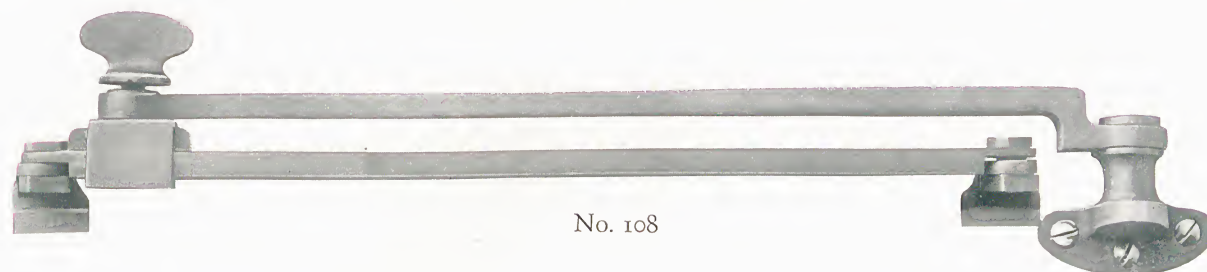
FOR GENERAL USE we advocate Peg Stays, as they are simple to operate, and positive in their action.

They are supplied in all lengths from 6" to 1' 6", in iron or gunmetal, to suit any size of window.

The Standard patterns 105 and 106 are of channel section, thus avoiding the liability of bending where the holes have been drilled. The channel also acts as a guide to the peg in getting it into the hole.

The knuckle is provided with a spur to keep the stay from falling on to the cill. The peg itself is tapered to ensure an easy fit without rattling. The bracket, which is welded to the frame, is provided with a shoulder, to prevent the stay being knocked against the glass, which is a common cause of breakage.

SLIDING STAY



No. 108

THIS PATTERN, made throughout in gunmetal, has the advantage of giving no internal projection to interfere with blinds or screens, and also permitting variable adjustment of opening, holding the casement rigidly in any position.

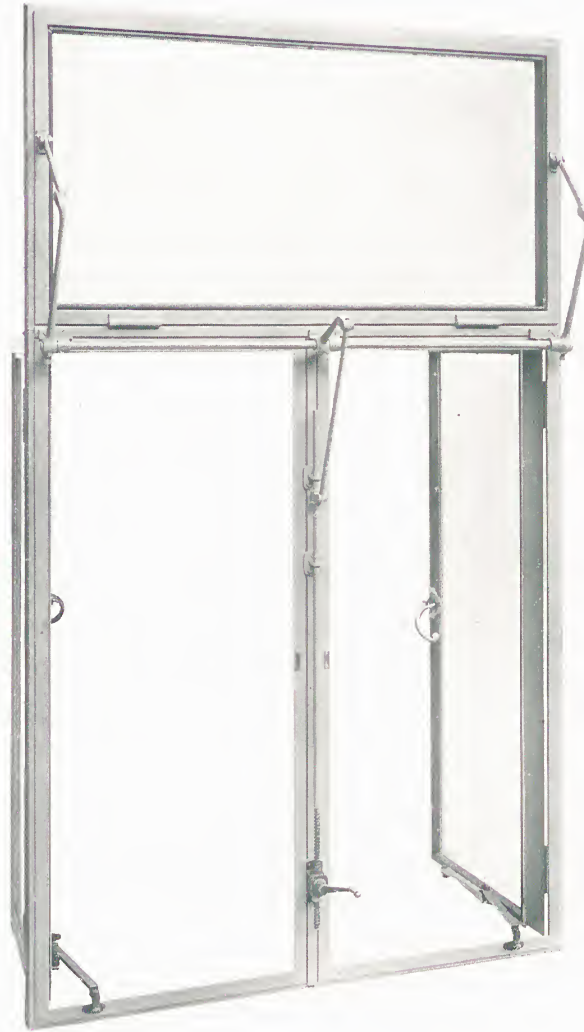
The fixed bar should be kept slightly greased to allow the box to slide freely. It can also be applied to inward opening casements.

CABIN HOOKS

UNLESS otherwise specified all casement doors, whether opening outwards or inwards, are fitted with Cabin Hooks, the eyes of which are attached to the frames; the hooks are sent loose to be fixed to wall in a suitable position.

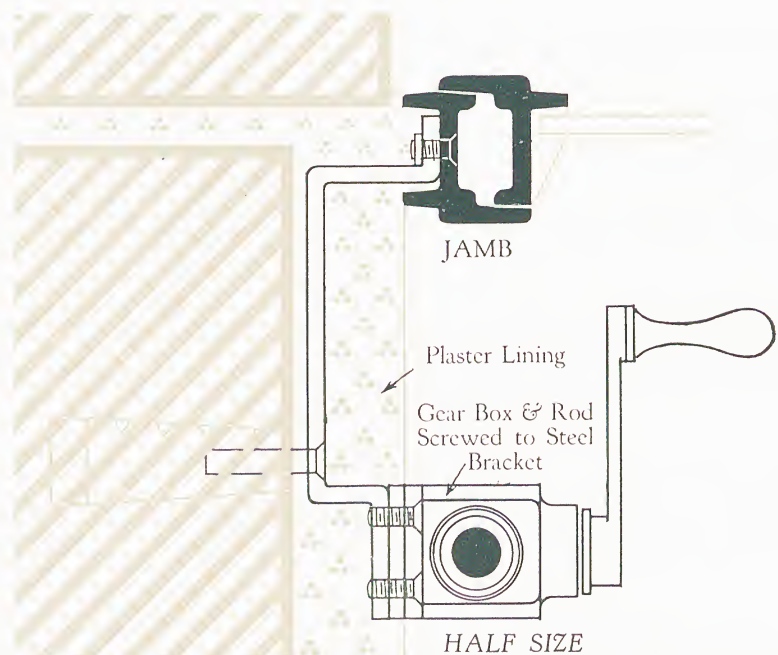


TRANSOME OPENERS



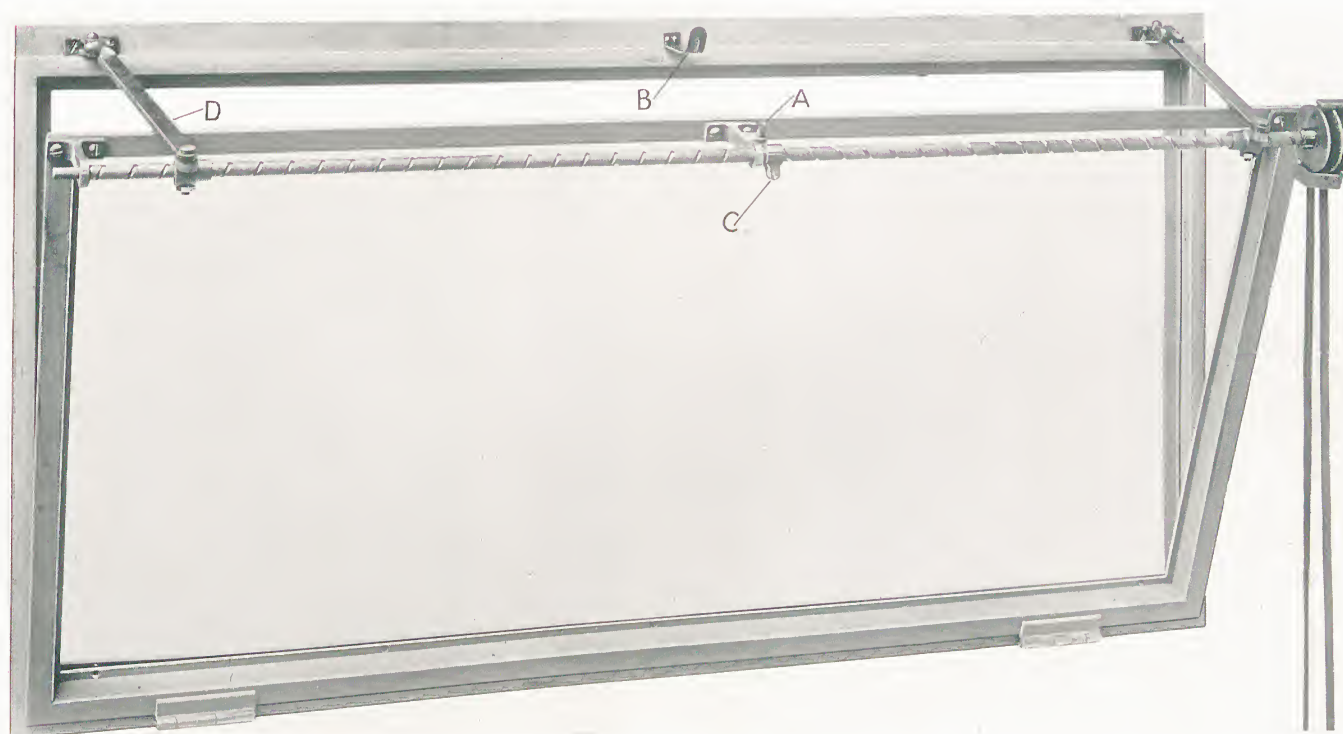
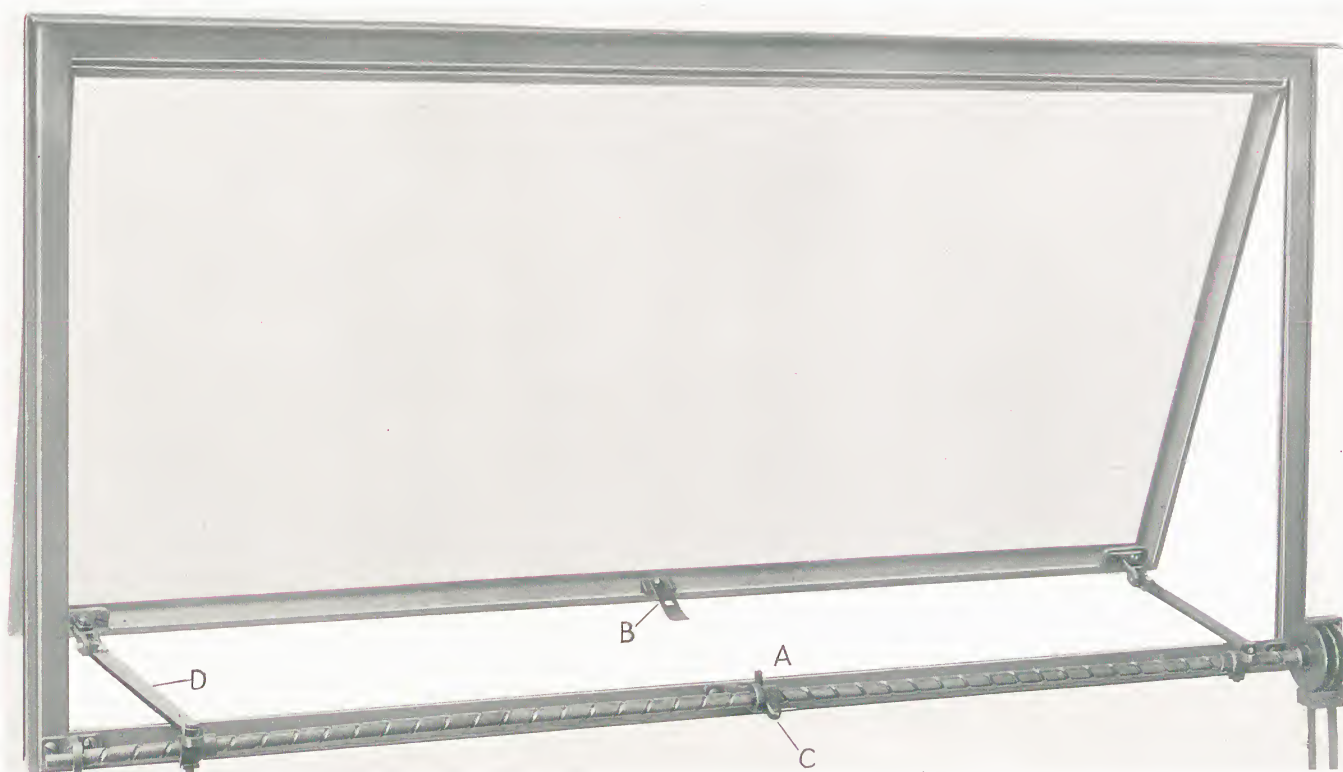
THIS type of screw gearing is applicable to top-hung, horizontal centre-hung, or bottom-hung casements, and is made in two sizes to open one or more ventilators of any practical size.

To facilitate erection, all gearing should be attached to the metal frame wherever possible, either to the meeting rail as shown above, or to brackets attached to the jambs.



DETAIL No. 13

TRANSOME OPERATORS



TO meet the requirements for a positive operator for windows that are not within easy reach from the ground we have designed a fitting shown in the two illustrations above.

As will be seen, it is applicable to top- or bottom-hung casements.

Flat canvas tapes replace the usual cords. These are kept at the side of the window and do not interfere with the openings of other windows below.

Unlike all previous fittings of this type, positive closing is provided by means of a peg (A) engaging with the hole (B) in a spring plate when shut. When it is required to open the window, the spring is released from the plate by means of a cam (C) revolving rod.

Where windows are less than 2' 6" wide, single arms are used in place of the double arms (D) shown above.

TRANSOME OPERATORS



NON-PROJECTING OPENER for top-hung casements (up to 2' 0" wide), operated by cords; secured by cleats.



RACK OPENER for top or bottom-hung casements (up to 3' 0" wide), operated by cords.



SPRING CATCH for bottom-hung or centre-hung casements (up to 3' 0" wide), operated by cords or long arm. The side arms, concealed inside the frame when shut, can be substituted with external folding side arms for cleaning purposes.



PEG STAYS for top-hung or horizontal centre-hung casements (up to 4' 0" wide) are suitable as an alternative to cord operators where the casements are within easy reach.

BRONZE DOORS AND WINDOWS



THERE IS AN INCREASING DESIRE on the part of Architects to introduce Bronze into modern buildings, partly because it is a permanent material (being free from corrosion and requiring no periodical painting), and partly because it is the only metal capable of expressing faithfully the modelling of the Sculptor—particularly after it has assumed the beautiful colour and finish resulting from exposure to the atmosphere. We have a staff of highly qualified designers whose services are always available for the preparation of designs, or for developing Architects' own designs if preferred; but in the latter case we wish to be given a certain amount of latitude in interpretation, as construction is always the governing factor, both as regards design and cost of production. It is to be regretted that in many examples of modern Bronze work there is a tendency—particularly in the case of doors—to reproduce in metal what is really a design for wood, forgetting the fact that with modern methods of manufacture Bronze can be rolled into large sheets and extruded into sections of great variety, thus giving the artist freedom to design plain surfaces with enrichment restricted to places where its greatest value can be given.

Special attention is paid to the modelling of such enrichment, which is entrusted to well-known London Sculptors, and we aim at producing a Bronze casting of such excellence that the 'feeling' intended by the Sculptor is faithfully reproduced without any necessity for chasing or tooling.

MAINTENANCE OF BRONZE WORK

One of the principal advantages of Bronze is that it does not corrode, and therefore requires no painting, but it must not be left for a long period of time without any attempt being made to remove the dust and soot which quickly accumulate in London and Provincial towns.

If the richness of the material is to be maintained, it must be kept clean in exactly the same way as is necessary in the case of glass or marble, that is with water and wash-leather. Paraffin or other oily substances should not be used, as any stickiness left on the surface of the Bronze will harbour dust and dirt. If left clean and dry, the natural oxidizing effect of the atmosphere will produce the richness usually associated with this material.

BRONZE DOORS

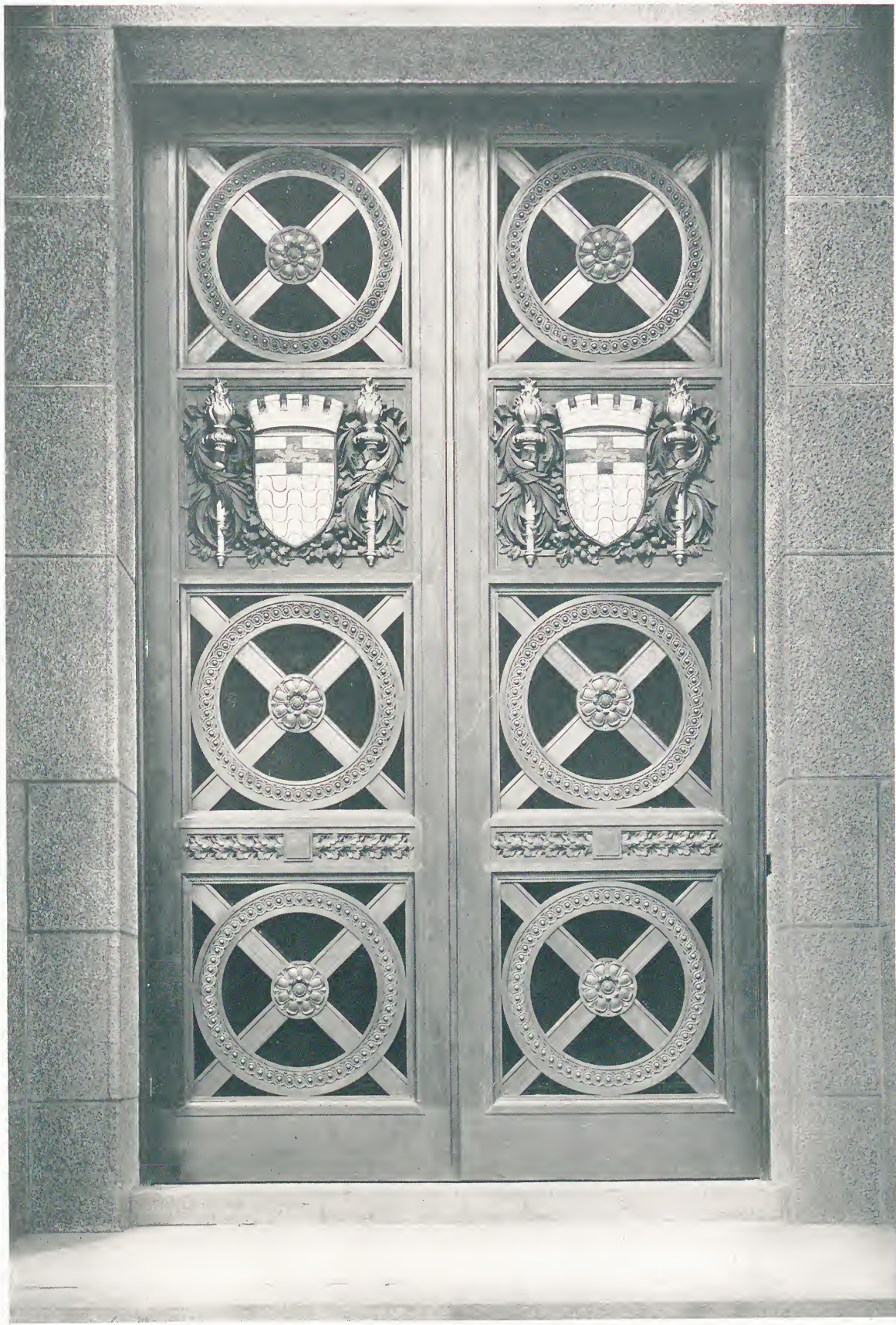


NEW COUNTY HALL, LONDON
Architect : RALPH KNOTT

Bronze Doors with Architrave and Cornice for Members' Entrance.

Overall dimensions of Bronze work: 19' 0 $\frac{3}{8}$ " high to top of Cornice \times 16' 3" wide.
Weight of each leaf of doors: 1 ton 8 cwts.

BRONZE DOORS

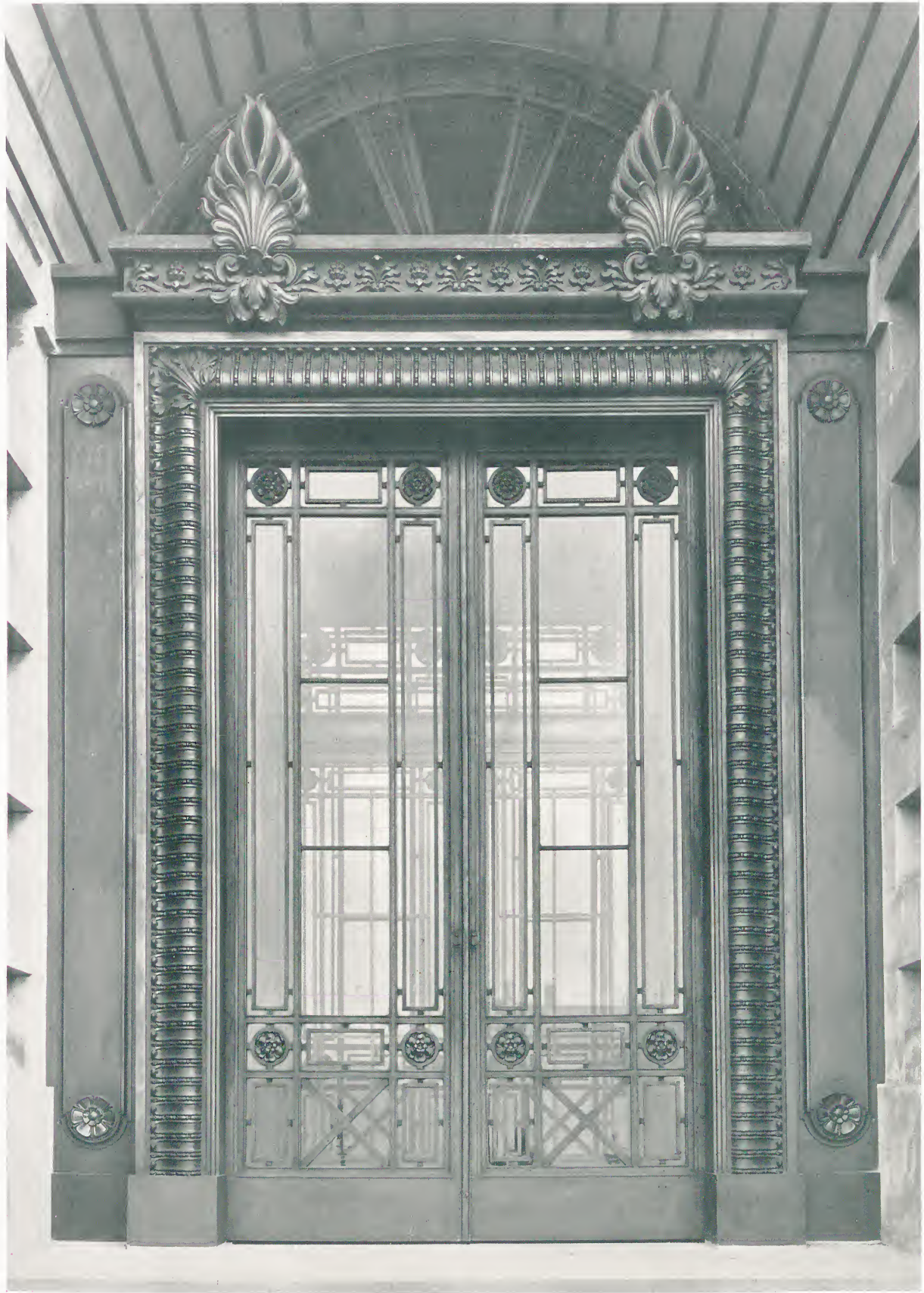


NEW COUNTY HALL, LONDON
Architect : RALPH KNOTT

Bronze Doors for Main Entrance, Belvedere Road.

The Entrance Hall in Belvedere Road has five pairs of Bronze Double Doors enriched, in the case of the Central Doors shown above, with the enamelled representation of the Arms of the Council. These Doors are 15' 6 $\frac{3}{8}$ " high \times 9' 0" wide.

BRONZE DOORS

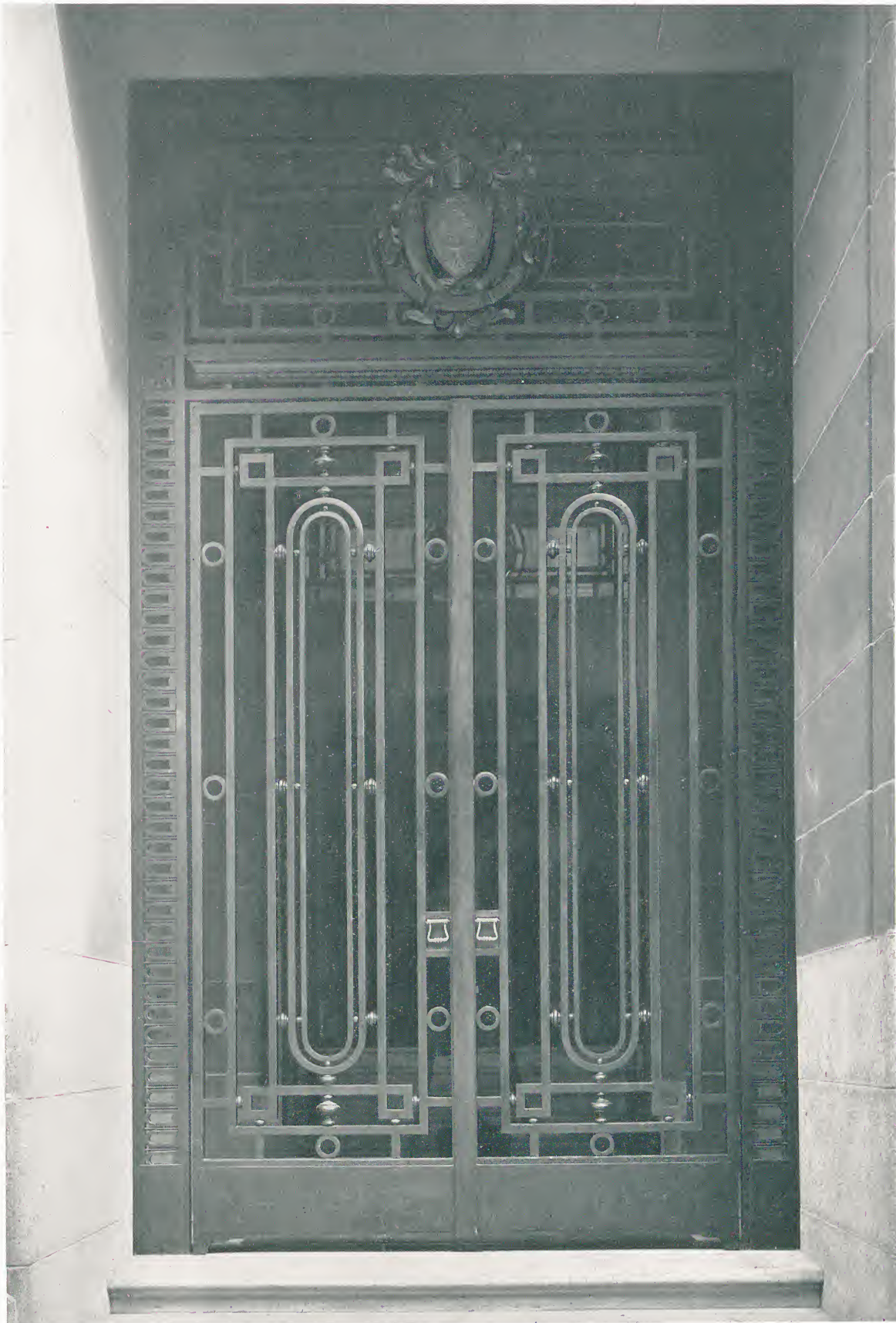


NEW COUNTY HALL, LONDON
Architect : RALPH KNOTT

Bronze Doors with Architrave and Cornice for Members' Terrace Entrance.

Overall dimensions of Bronze work : 15' 5 $\frac{3}{8}$ " high to top of
Cornice \times 13' 4 $\frac{1}{8}$ " wide.

BRONZE DOORS



GLASGOW MUNICIPAL BUILDINGS, BURGH COURT ENTRANCE

Architects: WATSON, SALMOND & GRAY

Gates in Wrought Iron with Bronze Enrichment, for an opening 14' 1 $\frac{5}{8}$ " high \times 8' 0" wide. We supplied six pairs of Bronze Doors and Gates for the principal entrances to the building.

BRONZE SHOP FRONTS



FULLERS' NEW PREMISES, REGENT STREET, LONDON

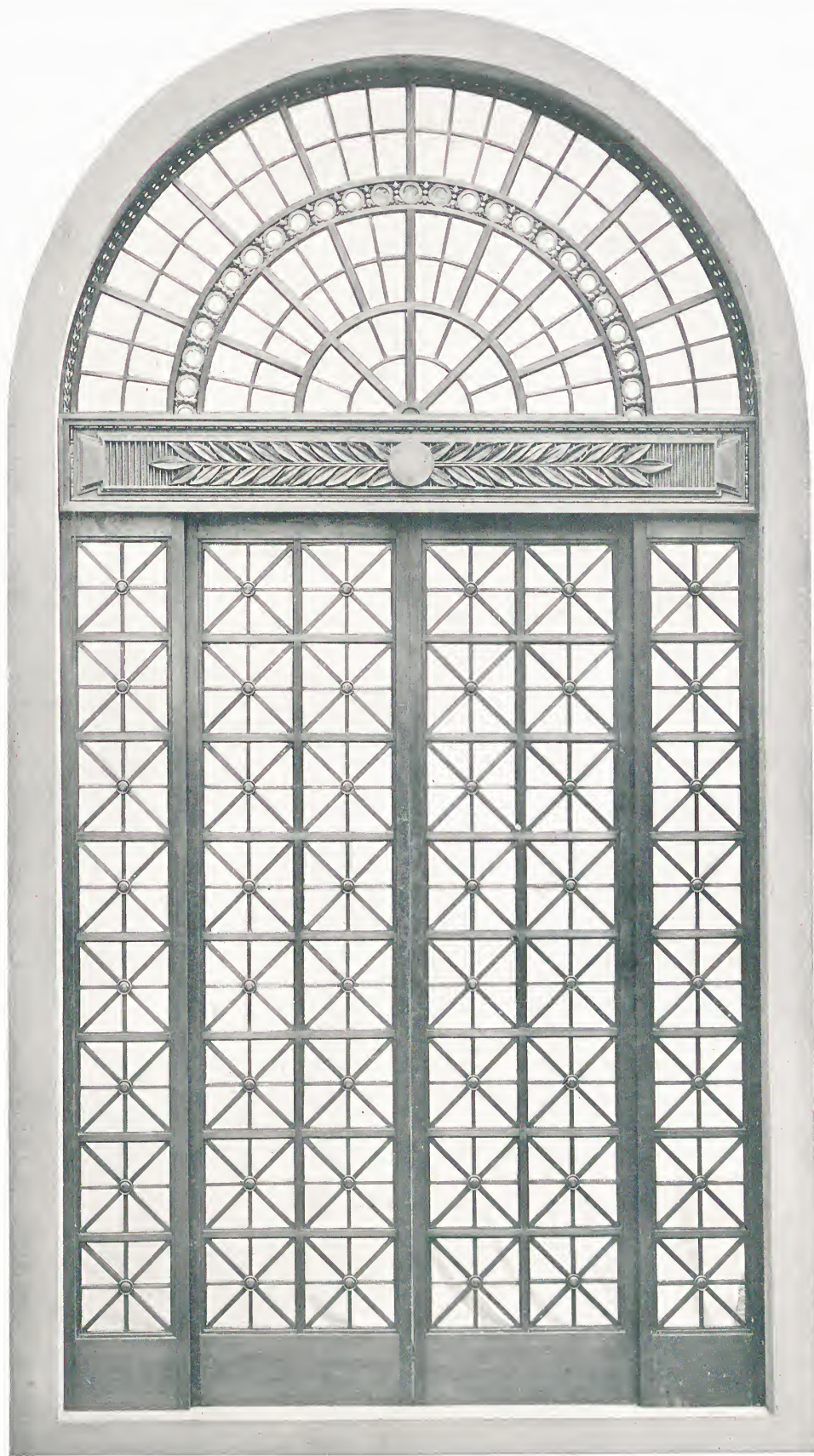
Architects: COLLCUTT & HAMP

Bronze Shop Front with Enriched Transome

BRONZE LIFT FRONTS

CRITTALL

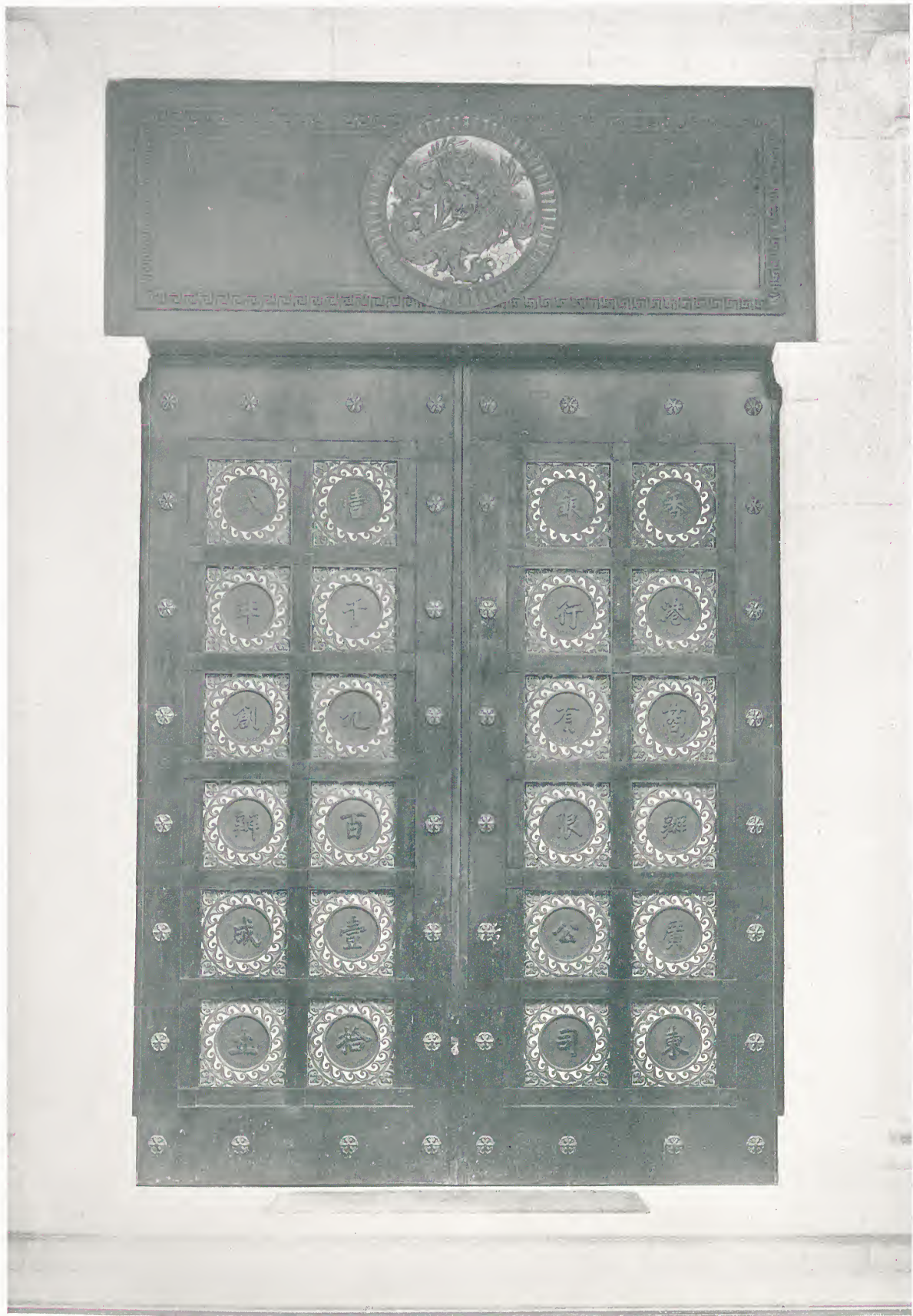
BRONZE



PETER ROBINSONS, OXFORD STREET, LONDON
Architects: T. P. & E. S. CLARKSON; and H. AUSTEN HALL

Bronze Fronts for Lift Enclosures, of which we supplied 72

BRONZE DOORS



BANK OF CANTON, HONGKONG

Architects : PALMER & TURNER, Hongkong & Shanghai

Bronze Doors with Cast Panels decorated with Enamel of variegated colour.

The Chinese characters in the panels indicate historical data connected with the Bank.
The Doors are 11' 4" high \times 8' 10 $\frac{1}{2}$ " wide. The surmounting panel with cast dragon is 3' 7 $\frac{1}{2}$ " high \times 9' 9 $\frac{1}{2}$ " wide.

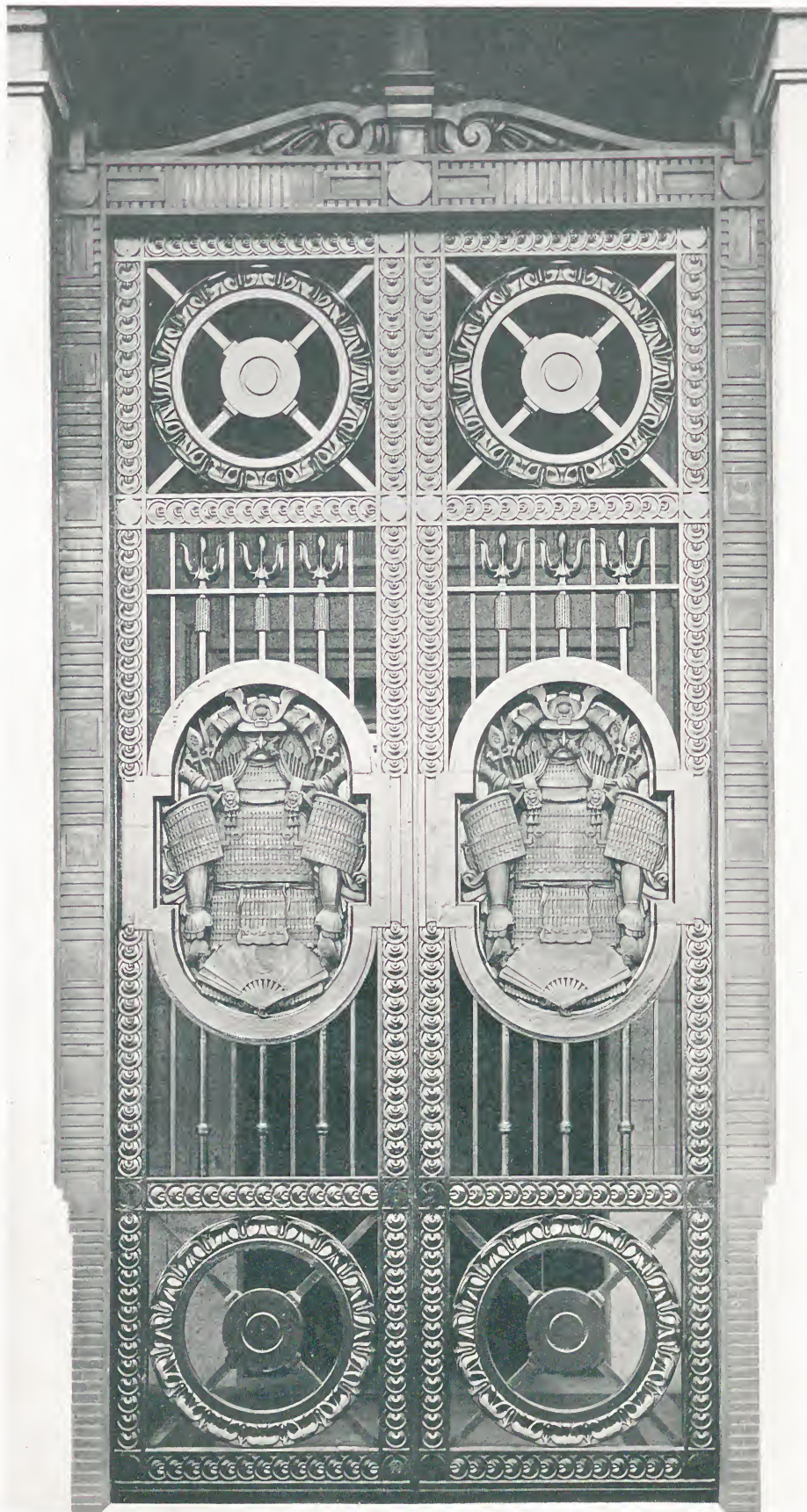
BRONZE DOORS



ANGLO-SOUTH AMERICAN BANK, BRADFORD
Architects: W. I. MORLEY & SON

Bronze Doors with Cast Enrichment, fixed to a Granite surround.
The size of the opening is 11' 8 $\frac{1}{4}$ " high \times 5' 0" wide

BRONZE DOORS



YOKOHAMA SPECIE BANK, SHANGHAI

Architects : PALMER & TURNER, Hongkong & Shanghai

Iron Gates with Bronze Enriched Panels representing Japanese Armour.
There are three pairs of these Gates at the main entrance to the Bank,
each pair being 19' 6" high overall \times 9' 6" wide

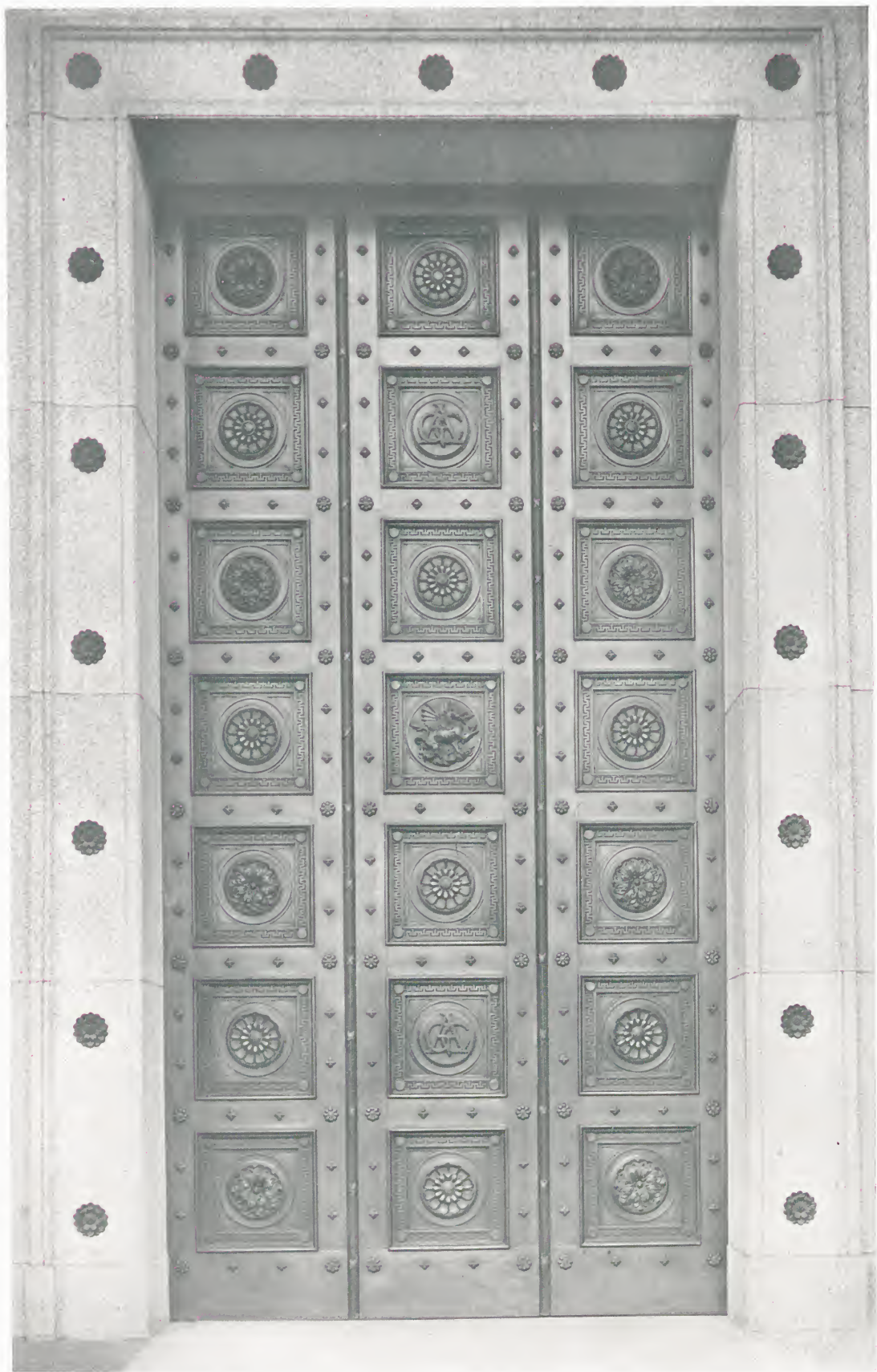
BRONZE DOORS



BARCLAYS BANK, PALL MALL EAST, LONDON
Architects: ARTHUR C. BLOMFIELD & ARTHUR J. DRIVER

Bronze Doors for main entrance. These Doors fold back in four leaves and when closed fill up an opening 12' 3" high \times 7' 6" wide

BRONZE DOORS



NATIONAL MUSEUM OF WALES
Architects: SMITH & BREWER

Bronze Doors with Cast Enriched Panels. These doors are 16' 0" high and 8' 0" wide. The twenty-one square panels are cast from specially prepared models

BRONZE DOORS

CRITTALL
BRONZE



Bronze Door erected in the Basilica of the Palace of Arts
at the British Empire Exhibition, Wembley, 1924

BRONZE 'UNIVERSAL' CASEMENTS



BRONZE 'UNIVERSAL' CASEMENTS are constructed of extruded sections and are similar in design, construction and application, to the rolled steel 'Universal' Casements described in the earlier part of this catalogue.

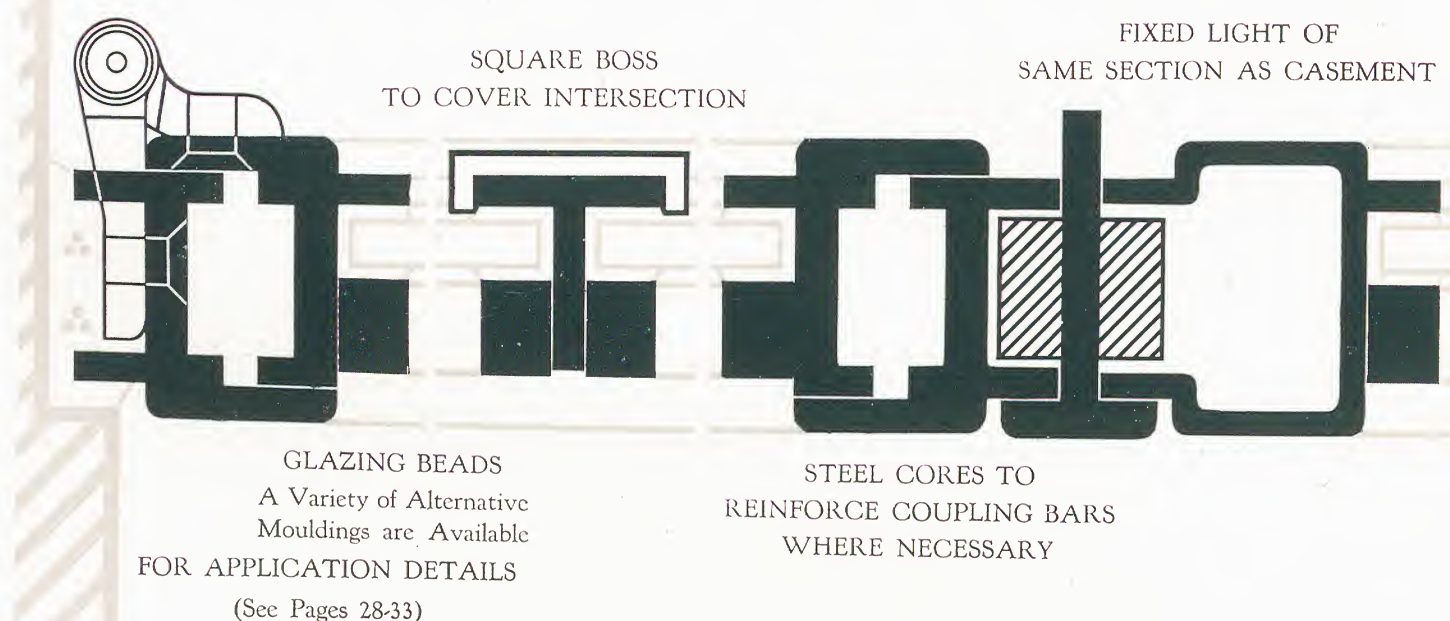
There are, however, minor variations due to the different nature of the material:—

1. FIXED LIGHT SECTIONS follow the same contour as the assembled casement sections. This gives uniformity of appearance between fixed and opening parts of the window.
2. INTERSECTION OF GLAZING BARS are covered with a square boss, in appearance indistinguishable from the Fenestra joint. This is necessary, as extruded sections cannot be intersected in the same way as steel.
3. HINGES have terminal ends to the steel pins to protect them from corrosion.
4. COUPLING BARS are reinforced where necessary by steel core bars, which are treated with anti-corrosive enamel.

The finished product is hand-polished all over and then chemically treated to bring it to a uniform colour, a dull nut-brown.

Bronze windows are delivered wrapped in waterproof paper, and the greatest care is taken in packing to avoid scratching, discoloration or abrasion.

O U T S I D E



FULL SIZE DETAILS (Medium Section)
OF BRONZE UNIVERSAL CASEMENTS

BRONZE ‘UNIVERSAL’ CASEMENTS



Fixed Light
Same Profile as
Opening Part

Bronze Universal
Sections (in three
sizes)
Identical to Steel
in Design and
Application

Bronze Boss at
Intersection

Bronze Terminals
to Hinge Pins



Exterior View of Typical Bronze Universal Windows

BRONZE INSTALLATIONS



NEW POST OFFICE
(In course of erection)



THREADNEEDLE STREET,
LONDON, E.C.

RECENT INSTALLATIONS

LONDON COUNTY HALL.—Doors
CHARTERED BANK OF INDIA, AUSTRALIA AND CHINA, Shanghai.—Doors and Windows
LICENSES AND GENERAL INSURANCE CO. LTD., Moorgate, E.C.—Ground Floor Windows
CENTENARY PAVILION, RIO DE JANEIRO EXHIBITION.—Doors and Grills
PETER ROBINSON LTD., Oxford Street, W.I.—Bronze Lift Doors
NATIONAL MUSEUM OF WALES, Cardiff.—Entrance Doors
MUNICIPAL BUILDINGS, Glasgow.—Doors and Grills
'THE ANGEL,' Islington, N.—Shop Fronts
MERCHANTS' MARINE INSURANCE CO. LTD., Cornhill, E.C.—Ground Floor Windows
ANGLO-SOUTH AMERICAN BANK, Bradford.—Doors and Windows
EASTERN BANK, Crosby Square, E.C.—Bay Windows
HONGKONG AND SHANGHAI BANK, Singapore.—Entrance Doors
BARCLAYS BANK LTD., Pall Mall, S.W.I.—Entrance Doors
BANK OF CANTON, Hongkong.—Entrance Doors and Grills

FULLERS LTD., Regent Street, W.I.—Shop Fronts
VIGO HOUSE, Regent Street, W.I.—Shop Fronts and Fascias
ANGLO-SOUTH AMERICAN BANK, Antofagasta, Chili.—Windows
STOCKPORT CO-OPERATIVE SOCIETY.—Windows and Shop Fronts
LIBERTY & CO. LTD., East India House, Regent Street, W.I.—Windows
CADENA CAFÉ, Tunbridge Wells.—Shop Fronts
DUNDEE ROYAL INFIRMARY.—Instrument Cabin
SESSIONS HOUSE, Bermuda.—Windows
THREADNEEDLE STREET POST OFFICE.—Windows
COMMERCIAL BANK OF SYDNEY.—Entrance Doors
UNION INSURANCE SOCIETY OF CANTON LTD., Singapore.—Entrance Doors
PENINSULAR HOTEL, Kowloon, Hongkong.—Shop Fronts, Doors and Windows
LAZARDS BANK.—Windows
MONTREAL CITY HALL.—Windows
SOUTHERN LIFE BUILDING, Pretoria.—Doors, Windows and Balconies



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PLAISTOW
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